



WINNER OF THE
QUEENS AWARD
FOR INNOVATION
FOR OUTSTANDING WORK IN
THE FIELD OF ADVANCED
MOBILE POWER SYSTEMS
2005

STERLING POWER

**Advanced Marine and
Automotive Power Products**



**DC to AC Inverters - Automatic Battery Chargers - Combined Inverter / Charger
Advanced Regulators - Alternator to Battery Chargers
Battery to Battery Chargers - Accessories and Components**



Introduction

Another year passed, we have moved to our new factory at Drotwich in Worcestershire, our 5th move in 15 years, each time I move I always think how on earth could we ever possibly fill the new place - and a year or two later its full again and we are looking for somewhere new.

As I am sure we have all caught very brief glimpses on the news that we are not in the best of times. Here at Sterling we are used to good growth every year since conception, and I can honestly say that the recent financial events have not gone unnoticed here. Lucky for us we have, as usual, invested in new innovative products which continue to come through to the annoyance of our competitors, which have, without doubt, enabled us to have much more penetration into the ever decreasing market, and so shielding us from the full ravages of this market. The key thing now is who will give the best value products on the market, that's what got us to where we are today, and I hope it will continue to keep us there.

All effort has gone into trying to maintain the prices in this catalogue for the full year, for the last 10 years we have been able to do this, however the money market this year make this highly unlikely, so there may need to be a price revision later in the year (who knows ???) the biggest problem is not the cost or raw materials but the £ vers the \$, already in the last 3 mths it has dropped 20% with I think more to come, so we simply have no option but to increase prices by at least 20% and hope this stabilises around the \$1.6 to the pound. (however my crystal ball is not that good)

Please remember **www.sterling-power.com** as we try to include all the up to date fitting instructions and help on 'downloads.' This way, you can see what you're getting yourself into prior to purchase. I am a great believer in telling the customer the good and any bad things about products, and attempting to make you as well informed as possible; this stops me getting it in the neck if a customer makes a mistake, or over assumes something, *Not that you would do that.*

Who, Where, Why and What are we about ?

Sterling Power Products is a small company wholly owned by me, Charles Sterling. I started out as a Marine Engineer Officer trained by British Petroleum, and worked on Super Tankers. This was a great experience; it was a little boring as these ships were new and never really broke down (they exploded the odd time but apart from that they were very reliable). So I left, and joined Canadian Pacific where I spent my time on container ships, ore carriers and other more interesting ships (more interesting from the engineering challenge point of view as they tended to be older, and therefore broke down more often). I did the running round the world thing and got into all the trouble you can imagine (ah, the good old days). I was one of the youngest people ever to hold a full seconds diesel (D.T.I.) ticket (steam and diesel) with part A and part of part B of a chief engineers ticket. But I was reluctant to spend my life running round the world from what appeared to be, one war zone to another, and where ones belief in god is directly proportional to how close that last bullet was to your head. I have always claimed to be a reasonable engineer, and as such, try to convey not just what a product does but why you need it. I endeavour to make this as simple as possible. Please bear in mind that I answer about 90 calls a day, and have targeted the literature at people who want to understand the products, but have been unable to get access to the information. Most companies' technical information is hidden in the sales jargon, not with Sterling. We are proud of what our equipment does and see no need to cover up any flaws with glossy vague sales literature. Flaws should be designed out of products, not covered up. All companies products suffer from technical problems, the trick is to find them and design them out as quickly as possible. Being a small company with its own in house design team, our response time is at a level that larger competitors can only dream about. The end result is our products just keep getting better and better, outstripping our competitors more and more every year. I started Sterling Power Products in my bedroom about 15 years ago, with the intention of bring new technology into the marine market at a reasonable price. I was the first in the UK to introduce switch mode battery chargers (with all its problems), 230 volt alternators (with all their problems), 3 stage advanced regulators (with even more problems) and other bits and pieces, bit by bit they were all sorted and now lead the world.

Manufacturing in Taiwan was always a sore point. But to my surprise I was amazed to see that labour costs are not why people manufacture in Taiwan. (The assembly workers earn just as much as over here). But the key was the cost of parts. For reasons which I do not understand, parts in Taiwan are at least 50% less than the UK. Prices of electronic parts are artificially held up by huge cartels in Europe (where manufacturing

is a dirty name). And as long as the British government (in fact not just the British) are happy about this they will continue to lose jobs to the Far East. The problem is, that at the end of the day cost does matter.

Sterling Power Products business plan is very simple. We design every conceivable performance and safety feature we can think of into our products; then we check our competitors just in case we missed something (however, we have never come across anything close). Having designed all the features we try to manufacture the products at a cost that will allow us to offer our customers a product with a high technical specification, but at the same time keeping the cost down. This is especially important when dealing with O.E.M's (Original Equipment Manufacturers, in our case boat builders). Builders want performance /safety/reliability but uppermost is price. This is why it is important to look at our **Quick Check list** to compare our products against our competitors, if you do this then you will see what I mean by the term "what competitors". Being the new kids on the block we are not where we want to be, but we are getting there fast.

Professional Mariner was purchased from Bob Adjerman (who retired about 5 years ago) by Bob Unger, one of the key players in Raython Marine. He has brought high standards with him and insists on the highest engineering and manufacturing standards.

To come up with the ideas is hard enough, but then to ensure the best quality at a low price makes it almost impossible. One big advantage Sterling and Professional Mariner have over our competitors, is that we are not what I call, a 'glossy' company. People buy our equipment based on recommendations and the performance of the products as a engineering solution, not on 'glossy' literature. Always remember the Company with the biggest catalogue, most expensive marketing, and biggest displays at shows, requires higher prices to cover all this. In this game the most expensive is by no stretch of the imagination the best. Thanks to all my loyal customers who got me here today, they have witnessed the product improvements over the years, and a big welcome to all our new customers who I hope will be delighted with our new products.

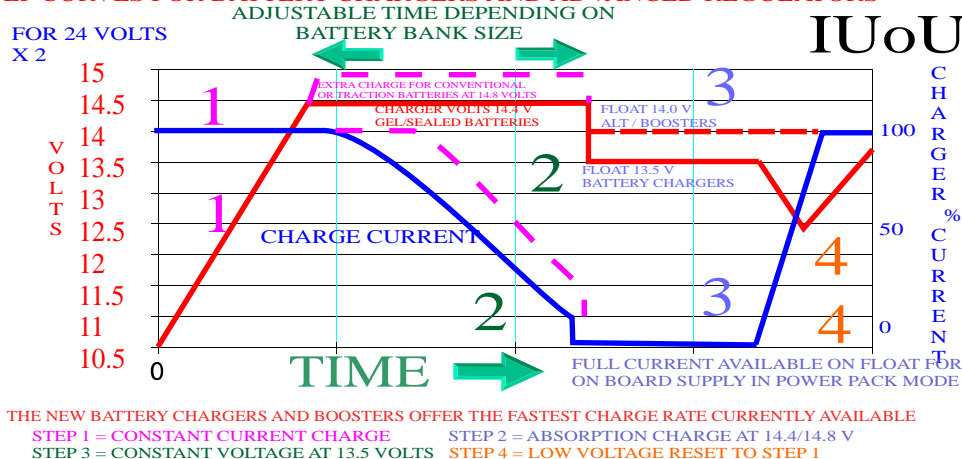
Charles Sterling. (M.D.)

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Charging curves for the 4 step battery chargers and the advanced alternator regulators

4 STEP CURVES FOR BATTERY CHARGERS AND ADVANCED REGULATORS



Pro Budget. Digital battery charger range

12 V 6 - 20 AMP

24 V 7 - 12 AMPS

This new compact design, low cost, adaptive, switch mode, 4 step, constant current, single output battery charger range is designed for use where only a single battery bank is to be charged. After the battery is charged the unit drops to a safe float voltage and will act as a power pack, safely delivering power to feed any on board power requirements up to the maximum current rating of the charger. Due to the reverse polarity protection feature of this unit, a battery with minimal charge level must be connected to the charger before it will activate, or become a power pack.

This charger is extremely compact, and is preset for use with open lead acid, sealed lead acid, gel, AGM or any battery where the charger voltage should not exceed 14.4 volts. (see charger voltage specification and performance below) This product is ideal for the vehicle/camper van market where only one output is required. This range offers all the features one would expect from the higher spec battery charger range but with lower cost.



Model: Part number	PB12V6A	PB12V10A	PB12V20A	PB24V7A	PB24V12A
Input voltage = A/C 180-240 v 47-63 hz	yes	yes	yes	yes	yes
Out put voltage :					
High charge voltage	14.4 max	14.4 max	14.4 max	28.8 max	28.8 max
Float voltage	13.6	13.6	13.6	27.2	27.2
Efficiency	87%	87%	87%	87%	87%
Protection:					
Reverse polarity protected	yes	yes	yes	yes	yes
Short circuit protected	yes	yes	yes	yes	yes
Overload protected	yes	yes	yes	yes	yes
Over temperature protected	yes	yes	yes	yes	yes
Thermostatically controlled cooling fan	yes	yes	yes	yes	yes
Charge cycle and protection Indication:					
L.E.D. R: power on G: float charger Y: high charger	yes	yes	yes	yes	yes
L.C.D	no	yes	yes	yes	yes
Meter, needle type	yes	no	no	no	no
Size in mm width height depth	70x48x155	103x50x167	115x60x186	103x50x167	115x60x186
Weight in kg	0.5	0.9	0.9	0.9	0.9
Accessories, Euro and English cable	no	yes	yes	yes	yes
PRICE INC VAT					

ideal for sportboats or equipment where the charger will be exposed to water washdown such as a power hose or petrol fumes such as petrol boats

Ignition protected, ideal for petrol boats

Advice: We recommend to use waterproof battery chargers where the waterproof aspect is a priority. For all other applications we recommend our digital control units (please refer to page 4) which are lighter and have a superior performance.

Pro-Sport. Waterproof battery charger

Totally waterproof (IP 68), fully isolated outputs 2 x 12 v or 1 x 24 v.

12 V 8 - 20 AMP

24 V 4 - 10 AMPS

- Extruded aluminum housing.
- Fully encapsulated to meet toughest waterproofing standard (IP 68).
- Both pos and neg fully isolated that enables the unit to charge 12 or 24v batteries.
- Adaptive charging, ensures max charge in the batteries.
- Lead acid / sealed (AGM/Gel) battery selectable.
- Dynamic thermal output control.
- LED power and charge indicators.
- Built-in protection distributed-on-demand.
- 4 step charging curve.
- Pre wired waterproof loom for easy installation.

1 AMP waterproof float charger ideal for jet ski, small boats, bikes, lawn mowers etc.



WATERPROOF / TOTALLY ISOLATED OUTPUTS -BATTERY CHARGERS

DC Volts	Amps	Outputs	Mains	Hertz	Size	Weight	Code	Price inc vat
12	1	1 x 12v	230v	50 hz			121CE	
12 & 24	8	2 x 12v or 1 x 24 v	180-230 v	30-80 hz	170 x 180 x 65 mm	3.6kg	PS1208	
12 & 24	12	2 x 12v or 1 x 24 v	180-230 v	30-80 hz	210 x 180 x 65 mm	4.1kg	PS1212	
12 & 24	20	2 x 12v or 1 x 24 v	180-230 v	30-80 hz	270 x 180 x 65 mm	4.5kg	PS1220	
12&24&36	20	3x12vor1x24&2x12 v	180-230 v	30-80 hz	270 x 180 x 65 mm	5.0kg	PS1220plus	

4 Step Constant Current 3 output progressive battery chargers/ Power packs

ProCharge C



**12 v 10 , 20, 30 amp
24 v 20 amp**

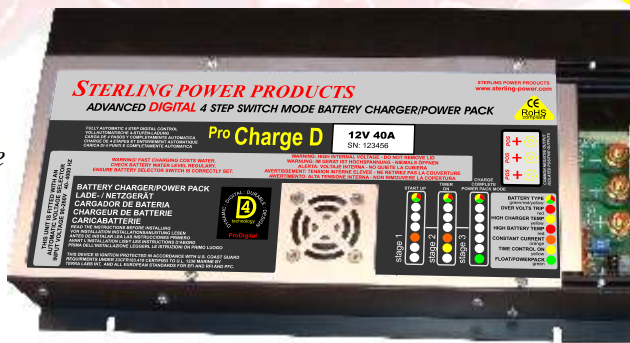
DC Volts	Amps	Mains V	a/c frequency	Size	Weight	Code	Price inc vat
12V	10	80-250V	40-400Hz	240 x165 x 60 mm	1.5kg	PC1210	
12V	20	80-250V	40-400Hz	240 x165 x 60 mm	1.8kg	PC1220	
12V	30	80-250V	40-400Hz	240 x165 x 60 mm	1.9kg	PC1230	
24V	20	80-250V	40-400Hz	320 x165 x 60 mm	2.5kg	PC2420	

This newly revamped and upgraded charger offers all the features of the international range but in a new look package and with extra features. The international range has proven to be one of the most successful on the market due to its price, extremely small footprint and performance. This 3 output unit accepts multi input voltage (80V-300V) and frequency (40Hz-400Hz) is ideal for the smaller boat.

- 1) 4 step adaptative battery charging.
- 2) Programmable for gel, open lead acid, sealed, maintenance free and AGM batteries.
- 3) Automatic universal 110/230volt 50/60Hz input tolerance.
- 4) Power pack function.
- 5) 3 isolated outputs.
- 6) Low cost, high performance ratio.
- 7) New 3 stage R.F.I. filter for even lower radio interference.
- 8) 24kt gold plated output terminal.

ProCharge D

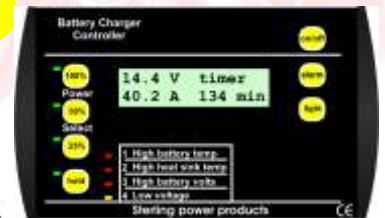
**12 v 30, 40, 50 amp
24 v 25 amp**



Includes
1 x battery
temperature
sensor

**Best Buy Winner
from Segeln
German yacht magazine test**

**Incl.
gold output fuse**



**Remote control
(optional extra)**

DC Volts	Amps	Mains V	a/c frequency	Size	Weight	Code	Price inc vat
12V	30	80-250V	40-400Hz	340 x 195 x 60 mm	3.0kg	1230CED	
12V	40	80-250V	40-400Hz	340 x 195 x 60 mm	3.0kg	1240CED	
12V	50	80-250V	40-400Hz	340 x 195 x 60 mm	3.0kg	1250CED	
24V	25	80-250V	40-400Hz	340 x 195 x 60 mm	3.0kg	2425CED	
Remote				170 x 90 x 40 mm	1.0kg	CEDRC	

The new DIGITAL range of battery chargers is the latest High Tech upgrade of the 'ProC' charger range. All the power benefits of the standard system are retained with the control, safety and information aspects upgraded beyond recognition. The latest benefits offered by digital adaptative control are highlighted in the Quick Check on the opposite page (page 5) and should be studied. Digital management ensures more accurate control, more battery information type storage in the software, more real time calculations to be done to ensure the best charge, more information is also available in the control chip which can then be displayed on the new remote control and information panel that is supplied as an option in the small range but as standard in the large range.

ProCharge N

Includes
1 x battery
temperature
sensor

**new
design**

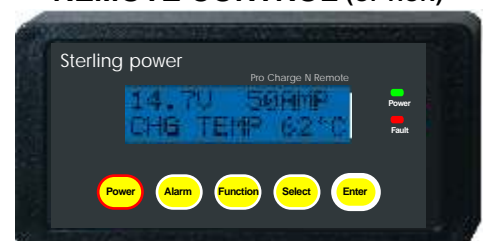


**12 v 40, 50 , 60 amps
24 v 35 amps
Twin installation up to 6 outputs
12 v 120 amps
24 v 70 amps**

aluminium A frame

The stylish powerful Digital Pro Charge N is the latest addition to Pro Charge range. This new product's impressive extra feature list can be seen on the next page. The units can, of course be used individually. For applications where that extra power is required, however, or even when extra outputs are needed (for example a larger boat could have 2 engine starter battery banks, main domestic bank, bow thruster bank and a generator battery), you can simply connect one output from each charger directing both chargers power into the domestic bank and feed the other 4 battery banks with the 4 remaining outputs. This also reduces the cable diameter required as the 4 smaller battery banks are only capable of receiving 1/2 the power of the larger battery bank. A special aluminium A frame has been designed to support 2 units in a small foot print. To enhance this ability even more a special power balancing box was designed specifically for the major American boat builders who wanted more economic power, they found that they preferred the small size of the twin system and, of course, the redundancy factor in case of a problem. If the higher power option is required, then the frame is simply a neat way to combine units together, the chargers are bolted to the pre made frame and the frame is secured to the bulkhead for a neat finish

REMOTE CONTROL (OPTION)



DC Volts	Amps	Mains V	a/c frequency	Size mm	Weight	Code	Price inc vat
12V	40	80-250V	40-400Hz	440L x 200W x 100H	5.0kg	PCN1240	
12V	50	80-250V	40-400Hz	440L x 200W x 100H	5.0kg	PCN1250	
12V	60	80-250V	40-400Hz	460L x 200W x 100H	5.5kg	PCN1260	
24V	35	80-250V	40-400Hz	460L x 200W x 100H	5.5kg	PCN2435	
Aluminum A frame to support 2 chargers				525L x 190W x 210H	1.0kg	PCNA	
Dual control box to ballance 2 units					0.1kg	PCND	
Remote control panel &10m cable				105L x 55W x 16D	0.1kg	PCNR	

STERLING QUICK CHECK LIST

Check these functions against our competitors
Green is a performance feature and Red a safety feature

	Pro Charge C	Pro Charge D	Pro Charge N
Adaptative charging	●	●	●
3 isolated outputs	●	●	●
Automatic 110/230 volt selector	●	●	●
Power pack mode	●	●	●
Multiple input frequency from 40-400 hz	●	●	●
Thermostatically controlled fan cooling	●	●	●
4 step constant current charging	●	●	●
High ambient temperature rated	●	●	●
4 different Battery type selector	●	●	●
Automatic battery bank size and state sensing	●	●	●
3 stage R.F.I. filter	●	●	●
3 led output display information panel	●	●	●
High heat sink temperature trip	●	●	●
24kt gold plated output terminal post	●	●	●
Reverse polarity protected (with fuse)	●	●	●
Over load protected	●	●	●
Short circuit protected	●	●	●
Sturdy aluminium construction	●	●	●
Small foot print, low profile	●	●	●
U.L and A,B,Y,C, certificated	●	●	●
Can be used in parallel operation	●	●	●
Digital software control	●	●	●
Battery temperature sensing and compensation	●	●	●
High battery voltage trip	●	●	●
High battery temperature trip	●	●	●
Negative fused externally (A.B.Y.C. Requirement)	●	●	●
Auto power reduction in event of high temperature	●	●	●
7 led output display information panel	●	●	●
Automatic 10 day de - sulphation cycle	●	●	●
Remote control socket for optional remote panel	●	●	●
Safety time out circuit	●	●	●
7 battery type selection	●	●	●
Calcium battery cycle included	●	●	●
De Sulphation cycle selector	●	●	●
10 LED information display	●	●	●
10 LED current bar display on charger	●	●	●
Voltage balancing control circuit	●	●	●
Parallel balancing ability	●	●	●
Extra features offered with the remote optional	●	●	●
Remote switch on/off	●	●	●
Manual power reduction selector	●	●	●
Auto memory power lock on setting	●	●	●
Delay start up to enable power setting change	●	●	●
2 line 16 bit L.C.D. display screen	●	●	●
High charge rate timer countdown	●	●	●
Auto cycle all information with manual screen lock	●	●	●
Displays all alarm functions	●	●	●
Display, volts amps temperatures etc	●	●	●

More descriptive information on the above functions

Adaptative Charging.

This is where the charger control circuit can increase or decrease the charging profile depending on the state and size of the batteries, low cost fixed chargers do not have this ability

3 isolated outputs:

The charger has 3 outputs enabling 3 different battery banks to be charged at the same time.

Automatic 110/230 volt selector:

The in built system enables the charger to be automatically used on a wide voltage range from 80-300 volts A/C. This covers all the possibilities encountered on any marina in the world.

Power Pack Mode

This is a absolutely critical aspect of any charger, the term Battery charger is used when asking for this type of product, however the term Power Pack is much more important as this is the ability of the unit to supply the d.c needs of the boats system after the batteries are charged. ie this product can run the boats d/c requirements (to the max amps of the unit) with no batteries on board (if required say for a new build or when along side)

Multiple input frequencies from 40-400 Hz:(switch mode design)

Self-explanatory, the unit is able to work on all worldwide A/C input frequencies.

Thermostatically controlled fan cooling:

The unit monitors the unit temperature and controls the fans; this reduces any unnecessary fan noise from the charger and enables the unit to operate at **high ambient temperatures**

4 Step constant current charging.

All modern chargers are should be constant current chargers as opposed to the old fashion constant voltage chargers, constant current chargers will charge over 10 times faster and should but about 30-40 % more charger into the batteries

High ambient temperature rated:

Many boat builders expect the chargers to work at full power continuously at 40 deg ambient, few chargers in Europe meet this A,B,Y,C, requirement - we do.

4 Different battery type selector :

There is more than one battery type; most chargers do not offer different programs for different battery types. Failure to offer an option will result in either overcharging some battery types and sulphating others. The Sterling offers charging curves for open lead acid batteries, traction batteries, sealed batteries, gel batteries and A.G.M batteries.

Automatic battery bank size and state:

No need to program in the battery bank size as the digital software can work that out itself.

3 stage R.F.I filter:

In order to meet C.E. requirements for Radio Frequency Interference a three-stage filter is used to ensure that not only is the standard reached but also that we fall well above the standard legally required.

High heat sink temp trip:

In the event of extreme temperature the battery charger will switch off at 70 deg C

24kt gold plated output terminal posts:

Over a period of time brass corrodes in salt air making poor connectors, we have all seen the green paste that forms around battery terminals etc. All Sterling connection posts are solid brass and are 24kt gold plated to eliminate this and ensure better connections.

Overload protected:

The unit cannot be overloaded and so engine or bow thrusters etc can be used while the charger is in operation without damage to the charger

Short circuit protected:

As stated the cant can be short-circuited with no adverse results.

Sturdy Aluminium construction.

All sterling chargers make good use of strong aluminium body , both to ensure heat is removed from the product and also add strength to the product. Plastic just will not do the job

Digital software control

There are 2 ways to control electronic processing, Analogue (hardware control) and Digital (soft ware control). Hardware control is where the voltage sensing and processing are all done via transistors and electronic hardware. This is fine as long as the information to be processed is kept simple.

Sterling leads the field in this type of controller but has found that when upgrading from our previous model, it required so many extra features to keep up with new battery types and alternator types etc, which makes a hard ware version impossible to make. Digital control (software): This uses computer lines of code, digitally burned into a memory processor in the battery chargers. This means that very complex information and mathematical processes can be processed, which would be impossible for the hardware system to do. It is the next generation of control and more and more you will see the term digital control appearing on different products. Digital control offers so many extra features at no extra cost (see below) and accuracy beyond the ability of the analogue version.

Battery temperature sensing and compensation:

The Sterling Digital comes complete with a battery temperature sensor, which is automatically set to one of the temperature compensation set by your battery type selector switch.

High battery voltage trip:

Things do go wrong no matter how hard we try so in the event of the regulator control failing, then any voltage above what the software is expecting will shut the battery charger down and display the fault.

High battery temperature trip:

It always amazes me how many companies sense battery temperature and compensate the charger voltage against temperature, but in the extreme event of total battery failure and the battery is going to boil the battery charger will not switch off the charger. The Sterling processor not only senses the temperature but will shut down the charger in event of total failure and display the fault condition.

Auto Power reduction in event of high temperature.

Because it is best to get as much power as possible at high temperature, in extreme high temperature or cooling fan failure, if the heat sink reaches 65 deg C then the output current of the unit will be systematically reduced to prevent the high temperature trip being activated at 70 deg C, its better getting something than nothing.

7 led output display information panel: High charger rate, timer activated, battery type (3 colours), Float mode, high battery temp trip, over voltage trip,

Automatic 10 day de-sulphation cycle:

The good thing about a constant current charger is that it de-sulphates the battery plates ensuring maximum life from the batteries. However, this only works if the charger is switched on/off regularly (i.e. every time you disconnect and reconnect the charger the plates are subjected to a de-sulphation cycle). The problem is some boats or standby equipment may be rarely used, for example., a boat could be moored all year and never leave the pontoon, or a stand by generator with the charger on all the time. In these cases the de-sulphation cycle would only happen once and the batteries would eventually sulphate causing premature destruction. However the Sterling software has a 7 day timer which in the event of inactivity will automatically run a de-sulphation cycle keeping your plates clean.

Remote control socket:

The unit has the ability to be connected to a digital L.C.D. information and control panel.

Safety time out circuit, in the event of defective batteries , and the charger is unable to complete its charger cycle, the unit will drop to a low float voltage after 10 hrs to reduce the damaged to batteries

7 battery type selection: The new control takes into account many more battery types than the normal units

Calcium battery cycle included: the new calcium batteries require charge voltage way above any normal chargers ability, failure to reach these voltages will damage the batteries.

De sulphation cycle selector. This unit has the ability to manually select a de-sulphation cycle , only to be used where batteries are sulphated or extremely discharged and require "brining back to life"

Voltage Balancing circuit. Multi output chargers can sometimes in extreme conditions under charge batteries due to voltage imbalance, this occurs mostly when new batteries are used and where there is very little discharge from these batteries. This unit has a separate control circuit to ensure all the batteries being charged remain within the voltage parameters set down in the cycle program selected.

Remote switch on/off: ability to switch the unit on and off from the remote panel

Manual power reduction selector: Some marinas offer only limited shore power; as a result high power battery chargers will not work. It therefore becomes necessary to reduce the out power of the charger to enable it to operate from the shore power. This remote offers the ability to select 100%, 50% or 25% power to deal with the lowest shore power supplies. Its best to have some power than none, this feature is also good if an onboard generator is used, i.e. you may want say a 100 amp charger for the onboard generator to charge the batteries fast but the local berth cannot support such a large charger. In this case the charger could be reduced to 25 amps when returned to the marina berth.

Auto memory power lock on setting:If reduced power is selected the software remembers the setting so in the event of removing the shore power the charger will start up on the reduced setting next time.

Delay start up to enable power setting change: In the event of a boat entering a marina and only a low power supply is available, if the last time the charger was used then the charger would start up on high power and trip the shore supply. To overcome this problem when the charger is started, the software counts down 30 seconds before automatically starting the charger on the last setting. This gives the operator ample time to reduce the power if required on the remote control.

2 line 16 bit L.C.D. display screen: As described above a large information screen is use which as an on/off switch for the background light.

Auto cycle all information with manual screen lock: Due to the large amount of information being displayed, it is not possible to fit it all on the screen. As a result the screen automatically scrolls through the screens. However you may wish to monitor one screen in particular, in this case simply push the lock button to lock that screen on.

Impressive information displayed: The L.C.D. display and control gives the following information, charger amps, charger volts, time remaining on equalizing charger, battery type selected, battery temperature, charger temperature, plus all alarm and other control functions.

Universal Advanced DIGITAL Alternator Regulators

THE PROBLEM:

Standard alternators are not designed to be good battery chargers; they are designed only to charge an engine start battery sufficiently to start the engine. Because of this inherent weakness with a standard regulator, a more advanced regulator is required that in effect converts an alternator from a constant voltage power supply to the latest 4-step constant current battery charger (see battery charger graphs). Because of this improvement in the alternator control system, these regulators dramatically enhance the alternator's charge rates by between 200-2000% depending on how poor the original system is. The Sterling System is the only real-time control system, that is in operation 100% of the time. This real-time control ensures the high charge cycle is switched off when the batteries are full (regardless of battery bank size or state) and the high charge will automatically reset itself after the charge has been completed and the output from the batteries exceeds the output from the alternator. Because it is real-time based, this monitoring and control is in operation whenever the engine is running. The Sterling Regulator is designed to charge batteries as fast as possible and to their maximum capacity without damage to the batteries or alternators. We opt, therefore, for a constant current charging mode as opposed to pulse charging that would double the charge time.

What To Expect From An Advanced Regulator:

- 1) Maintains maximum performance of an alternator's power curve within a preset envelope as defined by battery manufacturers.
- 2) Batteries charging 4-20 times faster.
- 3) Enables 25-35% extra useful power to be stored in batteries. A conventional alternator will only charge the battery to a max of about 75% and at about 40% remaining capacity the low voltage level renders it useless. This means that, of 100 amps of battery capacity, only about 35 amps are available to be used. An advanced regulator will fully charge the battery giving an extra 25% capacity that, in fact, increases the useable available power by about 70%.
- 4) Battery plates kept free from sulphate damage resulting in longer battery life.
- 5) Due to the built in safety features, in the event of incorrect installation the unit will switch itself off.
- 6) Reduces needless running hours on the main engine.
- 7) Compensates for voltage drops resulting from long cable runs, ammeters, diodes and other general wiring associated problems.
- 8) Automatically converts a machine-sensed alternator to a permanent battery sensed alternator.

This advanced regulator is the easiest to fit, safest, most powerful, and because it is an O.E.M product, the cost is low.

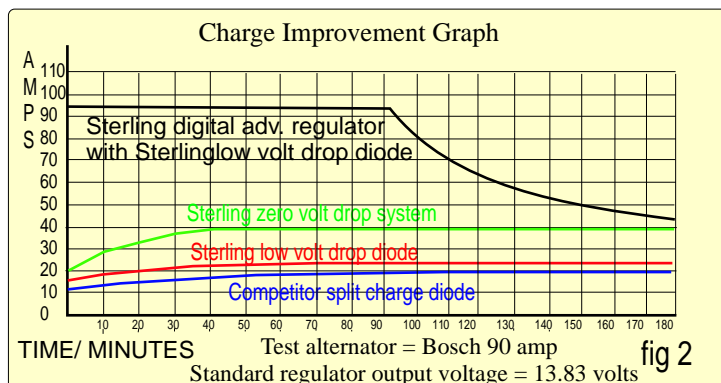
SAFETY FIRST:

The Sterling Advanced Regulator is full of safety features to prevent damage to your system. In the event of incorrect installation or a fault developing on the boat or vehicle, the high voltage trip picks up high voltages at the batteries and the alternator and switches off the advanced regulator (the field circuit is disconnected totally from the control via an internal relay).

The Sterling Unit was the first to introduce parallel operation with the regulator, ensuring continuous alternator operation even in the event of a system failure. Everyone in the power game recognises that the best battery charger you can buy is a multi step constant current charger. These have superseded the old constant voltage chargers, The Sterling regulator converts your alternator from an old constant voltage alternator to a modern constant current battery sensed charging alternator (see the difference in fig 2)

The test:

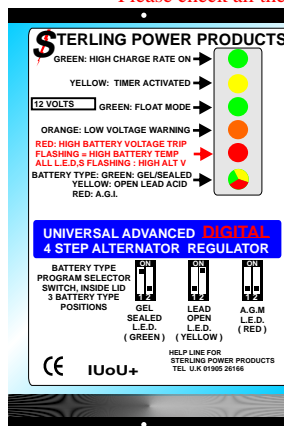
Using a standard 12V, 90 amp Bosch alternator fitted to our test bench, and rotated at a constant speed, the following test was undertaken. 4 x 100 amp "leisure" batteries were used, they were split into 2 battery banks, one for engine start and three for domestic. The engine start battery was fully charged (to copy that in real life) and the 3 x domestic batteries were discharged until such time as one of our 1800 watt inverters tripped out on low voltage. To make the test fair we linked 9 batteries together to make one larger battery bank then discharged them all to exactly the same level, then at random three batteries were selected and used for each test. The idea was to see how many amps could be replaced into a 300 amp battery bank which had been discharged to a level one would expect in real life (ie. about 50-60% empty) over a 3 hour period, and to display the results in as simple a way as possible to highlight the difference between all the different options and why an Advanced Regulator is a necessity not a gimmick.



for extra help always check
www.sterling-power.com
go to downloads

Universal Advanced Digital 4 step adaptative Alternator Regulator with temperature sensor

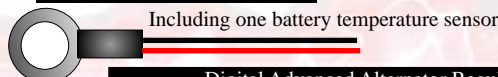
Please check all the Features on this model on Page 7



Sterling Power Products regards itself as one of, if not the foremost authority in this field in the world. A simple run through of all the features and technology used in the Sterling device against our competitors should enable you to make a clear choice, when you study our Quick Check List, then the price should clinch the deal.

We have two advanced regulator models and a totally new product offering an alternative approach to the same problem with the alternator to battery charger and the battery to battery charger that are much simpler to install, see next few pages in the catalogue

This unit cannot be used
with the remote
control panel below

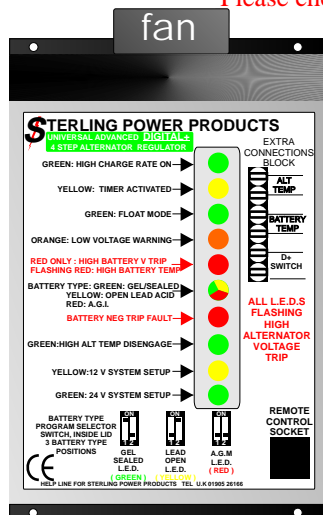


Digital Advanced Alternator Regulator				
DC Volts	Size	Weight	Code	Price inc vat
12V	120 x 70 x 45 mm	0.4kg	AR12VD	

Winner of
Best on test
Practical Boat Owner oct 2007

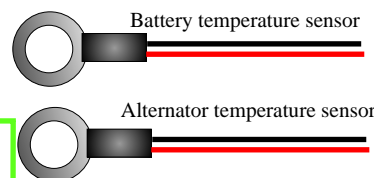
Pro Universal Advanced Digital adaptative Alternator Regulator 12/24V unit with remote option

Please check all the Features on this model on Page 7



The Pro version offers all the features available on the standard digital advanced regulator plus many new ones - the main extra features being the remote control panel, the extra cooling fan for larger alternators and the 12/24 volt capability. Please check the features on page 7 (those marked with # are additional features unique to the Pro Universal Advanced Alternator Regulator only).

Includes two temperature sensors

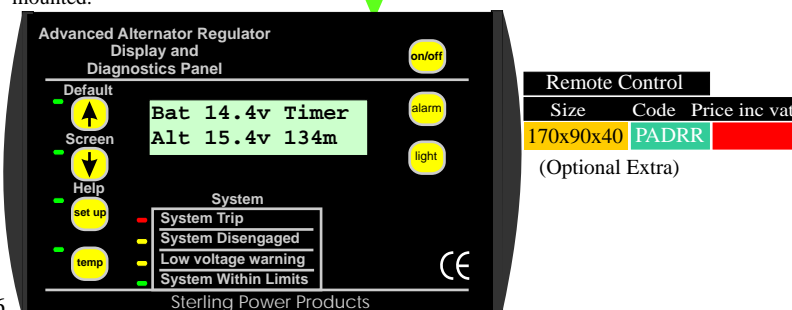


Pro-Digital Advanced Alternator Regulator				
DC Volts	Size	Weight	Code	Price inc vat
12V/24V	180 x 90 x 55 mm	0.5kg	PDAR	

Remote Control and information display (optional extra for above unit only)

The new remote control gives active information on the L.C.D. display such as Alternator voltage, Battery voltage, Alternator temperature, Battery temperature, set up details, time remaining on high charge etc. This unit not only displays all the fault conditions but also gives a detailed text scroll on the screen about the faults and what to do. Thus, ensuring on hand information in the case of a problem, even with the advanced regulator being switched off, a voltage display and alarm function is still in operation, making the unit useful at all times. A simple plug in lead ensures simple plug and play operation.

The new clever case design can either be panel mounted, flush mounted or surface mounted.



STERLING QUICKCHECK LIST

Check these functions against out competitors

Blue is a performance feature and Red is a safety feature

Highlights extra features in available in the Pro version only

Slow start	Yes
Digital software control / un-rivalled adaptative charging	Yes
# 12V or 24V operation from 1 unit	Yes
100% interactive with real time active control system	Yes
Can be used as a stand alone regulator	Yes
Programable for 4 different battery types	Yes
Different charging time calculated every time	Yes
One units fits all alternators and all battery type	Yes
Charges to 4 step constant current charging curves	Yes
Different charging envelope for each battery type	Yes
Self diagnosing fault system	Yes
Totally isolates the advanced regulator in fault condition	Yes
# Thermostatically controlled fan assisted cooling	Yes
Information LED display (over 10 different indicators)	Yes
Battery Temperature sensing	Yes
# Alternator temp monitoring and disengagement	Yes
High battery temp trip	Yes
High battery voltage trip	Yes
High alternator voltage trip	Yes
# Remote control and information panel	Yes
In event of failure auto return to standard alternator	Yes
M.N.E.A. 400 interface ready	Yes
Can be used with or without the temperature sensor	Yes
Protects batteries if temperature sensor open circuited	Yes
Protects batteries if split charge relay/diode fails open	Yes
Protects batteries if advanced reg fails closed	Yes
Protects batteries if battery sense wire falls off	Yes
Protects against excessive voltage drops in neg cable	Yes

Digital Advanced regulator Quick checklist explained

Slow start. The system ramps up the current over a short period of time to reduce the chance of alternator belt slip.

Digital software control: There are two ways to control electronic processing, Analogue (hardware control) and Digital (software control). Hardware control is where all voltage sensing and processing is carried out via transistors and electronic hardware. This is fine as long as the information to be processed is kept simple. However, an Advanced Regulator may look simple, and most of them are, but when all the different battery types, bank sizes, and safety parameters are incorporated the unit would become almost impossible to make and set up. Sterling leads the field in this type of controller and has found that when upgrading from our previous model we required so many extra features to keep up with new battery types and alternator types etc, that a hardware version was impractical to make.

Digital control (software) uses lines of computer code, digitally burned into a memory processor in the Advanced Regulator. This means that very complex information and mathematical algorithms can be processed that would not be possible with an analogue hardware system. It is the next generation of control and more and more you will see the term digital control appearing on different products.

12V and 24V operation from the same unit: In order to make the new unit truly universal, the one system can be programmed for 12V or 24V operation, a simple link switch is provided to convert the unit.

100% interactive with real time active control system:

Most other makes of Advanced Regulators are pre-set systems which do not process any information but simply run through a pre-set cycle regardless of what is actually going on. The Sterling digital system scans all the ongoing processes every two seconds and adjusts to meet any changes that may have occurred during the process and so has an active control system.

Can be used as a stand-alone regulator:

This unit can be used as a stand-alone regulator as well as in parallel with the original regulator.

The standard unit can be used with up to a 24V 300 amp alternator when in parallel with the alternators original regulator but only about 24V 100 amp when by itself. However, the new Digital High Performance model is good for at least 24V 300 amp by itself if required.

Programmable for four different battery types:

Most other manufacturers fail to recognize the fact that the world has more than one type of battery. There are now four main groups, open lead acid/traction, sealed /gel, gel (Europe) and AG.M. To optimise charging for each of these battery types there are four totally different charging curves, temperature curves and safety criteria with each battery type. In order to maintain the universal aspect of our unit it is important to tell the unit what type of battery you have, this ensures the maximum charge for that battery type. Failure to have this facility is inconceivable and means that the unit would be set at the minimum requirements and as such, would be a waste of time for open lead acid batteries. One wonders how the competitors manage.

Different charging time calculated every time:

Most other systems utilise a fixed timing system, where the high charge rate cycle is predetermined in hardware and never changes; i.e. the cycle is the same for 400 amp hr battery which is empty as a 10 amp hr battery which is full, clearly this is not ideal. The Digital Regulator calculates the high charge rate based on the following information.

1) Battery bank size. 2) Battery bank charge condition. 3) Current output.

These three criteria dramatically affect the charge rate settings of the digital unit. After the unit has processed the above information, it sets the high charge rate timer. The end result is a different duration every time, taking into account all the appropriate variables.

One unit fits all alternator and battery types:

This is a very important aspect for everyone. The reason for this is very simple, if you check other makes, you can find 12-15 different models to cover what the Sterling one will do. The problem with this is the public must supply correct information about their alternator and batteries to ensure they receive the correct Advanced Regulator. The end result is that regulators are being sent backwards and forwards all over the world because the information is not correct. It is almost impossible to identify most alternators and as a result a local chandlery will only stock a Sterling Advanced Regulator as it fits all alternator types.

For The Universal Advanced Digital Alternator Regulators

Charges to 4 step constant current charging curves.

All good battery chargers are constant current 3 -4 step. This method is recognized as the best charging type curves. The Sterling Advanced Regulator converts your basic constant voltage alternator into a modern 4 step constant current battery charger, it's that simple.

Different charging envelope for each battery type:

The different battery types require different charging curves. Failure to offer this selection to the customer will result in under achievement of a regulators' potential and the possible destruction of your batteries.

Self diagnosing fault findings:

The performance and benefits of an Advanced Regulator are beyond dispute, however, an Advanced Regulator, which has been incorrectly installed or fails, can have devastating effects on a boat. It will destroy the batteries and could easily set fire to cables.

Sterling takes all this into account and recognizes that some boats on which these regulators are used, have poor wiring and other faults. Because of this we scan the system every two seconds and if all the parameters are not within our pre-set values then the unit will switch off and tell you the fault. This in my opinion is the most important aspect of this type of device, a point not shared by our competitors.

Totally isolates the regulator in a fault condition:

This is very important as all regulators can fail for different reasons. If an Advanced Regulator fails closed then the alternator will work at full power and destroy everything around itself. Simply turning the regulator off will have no effect, so in the event of a Sterling system failing or tripping, for whatever reason, we physically break the field wire guaranteeing that the Advanced Regulator will stop working.

Thermostatically controlled fan assisted cooling:

Information L.E.D. display:

Most Advanced Regulators have no real information being transmitter to the operator and as a result one has no idea what is going on. I find this unacceptable, so we give the following information:

1) High charger rate on, 2) Float charge rate on, 3) Timer on, 4) Gel battery curve selected, 6) Open lead acid curve selected, 7) A.G.M curve selected, 8) High alternator voltage trip, 9) High battery voltage trip, 10) High battery temperature trip, 11) 12V or 24V, 13) High negative trip.

Battery temperature sensing:

One battery temperature sensor is supplied with the unit. This will adjust the output charging curves with the battery temperature.

Alternator temp monitoring and disengagement:

This unit can monitor the alternator temperature and switch off the control unit in event of high alternator temperature. The Advanced Regulator will automatically re-engage when the alternator cools down.

High battery temperature trip:

Most Advanced Regulators monitor the battery temperature to perform the task as explained above, but what is the point of monitoring the temperature if in the event of a battery going over temperature you do nothing about it? Sterling software will pick up the high temperature and in the worst case of a battery boiling, will switch off the advanced regulator and display a warning.

High battery voltage trip:

In the event of the battery voltage going too high the unit will switch the regulator off and display a warning

High alternator voltage trip:

This is the most common trip used. In the event of poor wiring, incorrect installation, or any fault in the system, the alternator voltage will rise too high; the unit will trip out and display a warning.

Remote control and information panel:

This unit comes complete with a flat, L.C.D. screen, 2 line, 16 digit display with a background light and alarm. This unit will display alternator voltage and temperature, battery voltage and temperature, all the system settings, and in the event of any of the alarm functions being activated, it will display a help screen explaining what is wrong and what to look for to fix it.

In event of failure auto return to standard regulator:

There are many good reasons to leave the standard regulator in place, one of them being that, in the event of a Sterling failure or any trip condition of the advanced regulator, your standard regulator will automatically take over and allow the journey to continue but at a lower charge rate. If your Advanced Regulators does not offer this feature then you will lose the use of the boat during any failure.

M.N.E.A. 400 interface ready:

The unit has the ability to connect to an interface; however, we are a little ahead of our time. The protocol has not been standardized for this feature to be effective as yet.

Can be used with or without temperature sensing:

Some people don't want to fit temperature sensors, the choice is yours, the software will pick up if you use it or not and control accordingly. Most other makes insist a temperature sensor be fitted.

Protects batteries if temperature sensor open circuited:

A big problem with temperature sensors (why people don't like fitting them) is that they are on a battery. If someone changes the batteries and breaks or open circuits the temperature sensor wire, most Advanced Regulators will destroy your batteries by over charging them. Not so with a Sterling. In the event of a failure of a cable break the Sterling software will pick it up within 2 seconds and return to the default settings and carry on safely.

Protects batteries if split charge relay/diode fails open.

A common fault when fitting an Advanced Regulator is the old split charge diode or relay is that it is not up to handling the new performance, and it fails. This will result in the destruction of the other battery bank, as the battery sense wire will be isolated from the alternator (but not with a Sterling, again our software jumps in and saves the day).

Protects batteries if advanced regulator fails:

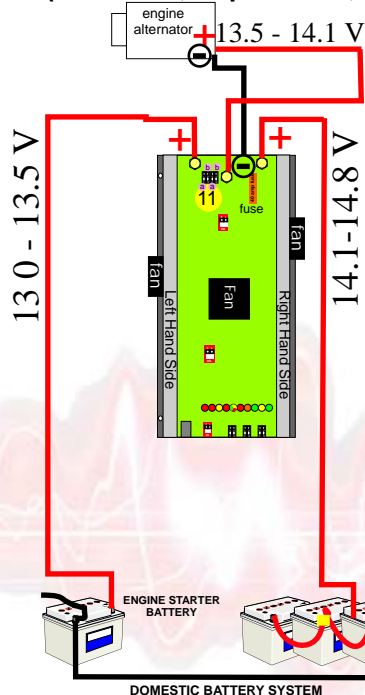
In the unlikely event of the Advanced Regulator failing then most regulators will fail closed and destroy all your batteries (would it surprise you to know that the Sterling software will jump in and save the day again?).

Protects Batteries if the battery sense wire falls off:

This is not uncommon, people change batteries and break the alternator sense wire, as a result the Advanced Regulator has no reference voltage and will destroy all the batteries on the boat, that is unless you have a Sterling (OK. its getting boring now) guess what? It protects against excessive voltage drops in negative cable. Most Advanced Regulators give a warning or switch off if a fault develops or is already in the positive cable, but the new Sterling also monitors and protects the system from the more rare but just as dangerous faults in the negative cable. Our unit checks the voltage drop from the battery negative and the true negative at the alternator and if the connections are not good or the cables are too thin, then an alarm will be issued and the system will shut down.

Alternator to Battery 4 step DIGITAL Split Charger

System wiring (minimum requirement,)

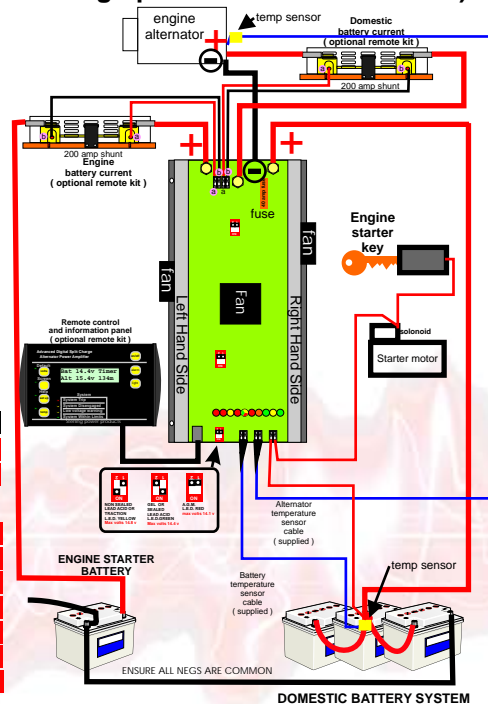


not just a new product
but a whole new concept
All the performance of an advanced alternator
regulator without all the fitting



Volts	Amps	Size	Weight	Code	Price inc vat
12V	80A	250 mm x 180mm x 70mm	2.5kg	AB1280	
12V	130A	250 mm x 180mm x 70mm	2.5kg	AB12130	
Remote & 10m cable		105L x 55W x 16D	0.1kg	ABNRC	
12V	160A	250mm x 280mm x 70mm	3.5kg	AB12160	
12V	210A	250mm x 280mm x 70mm	3.5kg	AB12210	
24V	60A	250mm x 280mm x 70mm	3.5kg	AB2460	
24V	100A	250mm x 280mm x 70mm	3.5kg	AB24100	
24V	150A	250mm x 280mm x 70mm	3.5kg	AB24150	
24V	200A	250mm x 280mm x 70mm	3.5kg	AB24200	
Remote		inc 2 x 200a shunts plus	3.5kg	ABRC	

Full System wiring (including optional remote kit if used)



Charge your batteries over 5 times faster,
input 50% extra power plus de-sulphate them
batteries and make them last longer.

Can be used with 2 alternators

Available in 80 / 130 / 160 / 210 amp model

This is a 100% unique product, not available anywhere else in the world, and totally designed and conceived by Sterling. In order to overcome all problems experienced now, and anticipated in the future, with standard advanced alternator regulators. This following explanation is to help understand what it does and where it should be used and should not in any way be taken to demean any of the other charging products we manufacture.

The Digital Advanced Alternator Regulator offers the best low cost technical solution to maximise the performance of your alternator ensuring adaptative charging. There are, however, applications and markets that require a different approach to increasing the alternator performance; without all the work and expertise required to install a regulator.

Problems with Advanced alternator regulators are:

The main problems with all standard advanced regulators are:

- 1) **Relatively difficult to install.** This prevents semi skilled personnel from fitting this type of unit.
- 2) **Requires the removal of the existing alternator to work on it.** This is not always easy to achieve and can add many hours of awkward work to an otherwise simple installation.
- 3) **Requires extra cables to be run on the boat or vehicle.** Again this can appear a simple thing, until a few hours work is required to pass a cable through a bulkhead or some other difficult place.
- 4) **Warranty on new engines:** some engine/vehicle dealers raise warranty issues if a new alternator is modified to fit an advanced regulator with this product the alternator is not tampered with.
- 5) **E.C.U. problems** Many new systems have E.C.U.'s (electronic control systems) on their engine management systems, any attempt to fit an Advanced Regulator will result in alarms going off (mostly in vehicles and motor homes). This trend may work its way into the marine market). This new system ensures the main vehicle/boat voltage remains within the E.C.U.s programmed parameters and allows the extra battery bank to be charged at the higher voltages needed to achieve fast charging.
- 6) **Total Package** 95% of installations using an Advanced Alternator Regulator also have some sort of split charger system. This product already has this split charge system built in to it.

How do we do this.

Well, in theory, it is very simple. With an advanced regulator which connects to the alternators regulator, we override the standard alternator regulator and we push the alternators voltage up to increase the voltage at the batteries . This results in a massive charge improvement at the batteries.

With the voltage amplifier we do the reverse. We put a load on the alternator to pull the alternator voltage down. This fools the alternator into thinking that there is a major drain on the system and as such the standard regulator works at full current. However, the voltage is pulled down to a totally useless voltage for charging batteries. So the new system takes in this high current, but low voltage, and amplifies the voltage to charge the auxiliary battery bank at a much higher voltage than the base system voltage. In order to achieve the fast battery charging, the software control program and settings for this product are the same as for our **Digital battery chargers and the Digital advanced alternator regulator.**

When would I use a Digital Split power amplifier as opposed to a Digital Advanced Alternator Regulator?

- 1) If you are a boat builder or vehicle builder and labour costs are a critical issue, Then this unit wins hands down. It requires only one extra wire (a negative) to the unit, the other power cables will already be standard. The only wires required for this unit are the alternator in and domestic + engine battery out.
- 2) If you are worried about the time and effort that it takes to fit an advanced regulator, then this unit will win. If you already have a split charger diode installed then the fitting for this unit will be about 15 mins.
- 3) If you have a voltage sensitive base platform (ie a car or van with a E.C.U. with high voltage alarms) then this is a must.
- 4) If you have warranty issues with a new engine, then this unit simply does not touch the alternator, as a result there is no warranty conflict.
- 5) If you are worried about finding a competent electrician abroad, or concerned about the fitting costs of an advanced regulator, then this is the solution.

What does this new product do?

This new product incorporates a split charge diode system to charge 2 battery banks. However, on the domestic battery bank channel only, there is a unique power amplifier. This ensures the alternator works at its maximum output (it could also be used on a single output battery charger or other current limited power source) and increases the voltage of the domestic line (with software digital control) up to 14.1 volts (for A.G.M) 14.4. (for gel) and 14.8 for open lead acid/traction. Using the same advanced program in the very successful Digital Advanced Regulator. (See Advance Digital Alternator Regulator section for performance improvement graphs)

What other uses for this product?

This product could be used on any other product which has current limit on it. For example, if you have an old fashioned constant voltage transformer based battery charger (or a constant current with low preset voltage controls and poor timer performance) which does not work very well, then simply attach this to the output of the old battery charger, and you will have the latest digital controlled 4 step charger, with all the programs, remote control and split output of the latest chargers on the market. Plus, at least a performance increase of about 500% (charger must not exceed the current rating of the device purchased).

Extra Features built into the system for use if require

- 1) Battery temperature sensing.
- 2) Alternator temperature sensing. This disengages the unit in the event of the alternator temperature getting too high, it then re engages the unit when the alternator cools down.
- 3) Battery sensor: The system battery sensor is built into the unit and is connected to the battery out terminal. An extension cable can, however, be fitted to sense the voltage at the battery thus improving the performance slightly in the event of long cable runs.
- 4) Ignition start. Some alternators require a voltage on the alternator to start up. A split diode will prevent such an alternator from working. However there is a built in device to overcome this problem in the event of such a alternator type being used.
- 5) The remote control. This offers full set-up information, plus voltages and temperatures of all the relevant places, as per the digital alternator regulator.
- 6) Current measurement. This unit, as standard, does not measure current. However if the optional Remote control is purchased it can measure the current to the domestic system (on both remote models) however the remote on the 160-210 amp models can also measure the alternator and starter battery currents, it comes complete with 2x pre wired shunts that enable 2 currents to be monitored and the third current to be derived from the first two using the embedded software.

The end package is a very simple and easy installation with all the performance and safety features of the most expensive Advanced Alternator Regulators, but with a extremely simple and convenient installation method.

What do I expect to see from this unit and why?

The illustration below shows results from bench tests representing a typical split charge system with an engine battery of 100 amp hr (standard lead acid) and a domestic battery of 3 x 100 amp hr (standard lead acid). The engine battery was discharged to 11 volts (about 10 engine starts) and the domestic bank to about 11 volts (will no longer run an inverter and is about 60% empty). The alternator used was a Bosch 90 amp with a standard 13.9 volt (variable) regulator. The unit battery type is programmed to open lead acid. There are 2 x graphs, one is the current delivered into the batteries, and the other is various voltages measured on the system.

System voltage graph:

The key points to pick up on here are:

The yellow trace (alternator voltage into the unit) clearly shows the system doing its job it is designed to pull this voltage down a little to enable the standard alternator regulator to produce its full current, you can clearly see that the standard alternator voltage is at position 4 on the voltage curve, however the input voltage has been pulled down to position 5, the effect on the alternator output current is full output at position 8-9, where you can clearly see the standard alternator current without the advanced charging system taper down fast from 80 - 30 amps over the same time (from position

2-3). The advanced charging equates to about 70 amps improvement over the standard non assisted alternator.

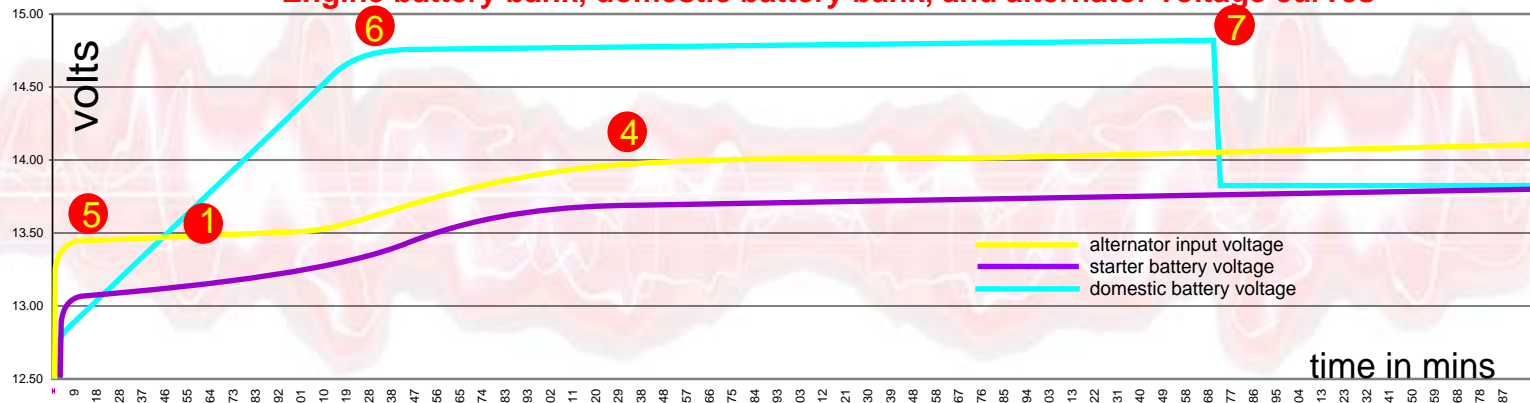
Position 1 : This is the most interesting stage where the magic is at work, the point where the domestic battery voltage exceeds the alternator input voltage, this is what the advanced charging process is all about.

The current graph The domestic current graph clearly shows the constant current charge between points 8-9, at position 9 the current starts to taper off until it reaches position 10. The accuracy of the software can be seen when the voltage drops from the high voltage charge to the constant voltage charge (float), the current only dropped 5 amps, (at position 10) showing without doubt that the software program was spot on, the batteries could not accept any more positive charge and were clearly full. The high charge voltage is maintained between voltage positions 6-7 at 14.8 volts.

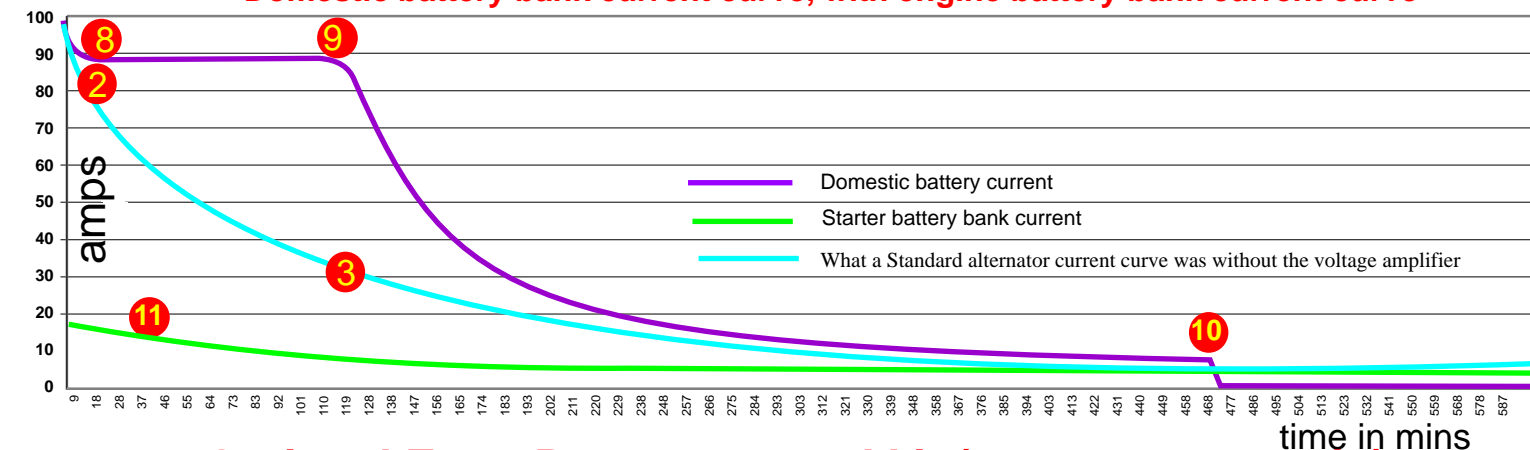
Engine priority

Position 11 shows that through the whole process the engine battery continues to charge and is not deprived of its charging voltage, the engine battery performance is the most important as at the end of the day it must be able to restart the engine.

Engine battery bank, domestic battery bank, and alternator voltage curves

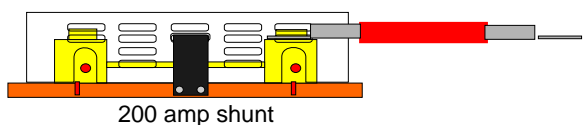
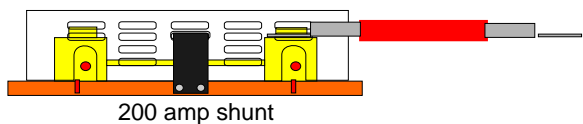
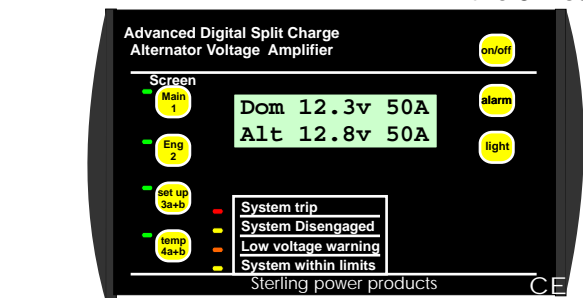


Domestic battery bank current curve, with engine battery bank current curve



Optional Extra Remote control kit (160-210 amp unit)

Included parts: the remote panel, 10 metres of pre wired link cable and 2 x 200 amp pre wired shunts
the 2 x shunts enable 2 x real currents to be measured and 1 x current calculated in the software
the 3 x currents to be measured, accuracy +-5%



Screen1:

Push button marked Main 1, this is the main screen and the one it is best to leave the unit on, it shows the domestic battery voltage and current, also the alternator output current

Screen2:

Push button marked Eng 2, shows the engine battery voltage and current, This screen also shows the elapsed time.

Screen 3a:

Push button marked Setup 3a+b: There are 2 x screens on this button. Push once for screen a, then again for screen b. Screen a shows the system setup, this refers to the domestic battery only

Screen 3b:

Push button marked Setup 3a+b: There are 2 x screens on this button. Screen b shows the effective boost being delivered at this time and ranges from 0% (during the rest

Screen 4a:

Push button marked Temp 4a+b: There are 2 x screens on this button. Push once for screen a, then again for screen b. Screen a shows the alternator temp and the domestic battery temp, if the temperature sensors are not fitted it will default

Screen 4b:

Push button marked Temp 4a+b: There are 2 x screens on this button. Push once for screen a, then again for screen b. Screen b shows the box heat sink temperatures, LHS stands

Dom 12.3v 50A
Alt 12.8v 50A

Start 12.7 4A
Timer: 134 m

System set:12v
Bat Type : Wet

Alt Controller
Power 13% Bost

Alt Temp + 20C
Bat Temp + 20C

Case LHS + 17C
Case RHS + 23C

Battery to Battery 4 step DIGITAL Charger

On the surface this may look like another way of having an advanced regulator without wires (like the alt-bat charger on previous page) and in a way it is, however, this method has a specific market in mind and, like the advanced regulator and the voltage amplifier, it has a very precise slot which it has been designed for and fulfills perfectly.

Why do I need the d/c adaptative battery charger?

By now you will appreciate that the best way to charge a battery is using a 4 step battery charging curve (that cannot be achieved from a standard alternator). This system enables one to simply attach the unit to a standard engine battery and it will fool the alternator into working at its maximum ability and ensure all its surplus power is used to charge the auxiliary battery bank to its maximum. This system is design to use only the surplus power and ensures that at all times the power required to run the primary system (the vehicle system or the boat engine) is not affected. The surplus power is converted into a higher voltage and used to charge a secondary battery bank using a digitally controlled programmable 4 step charging curve as per all the other high charge products Sterling makes.

What performance improvements would I expect?

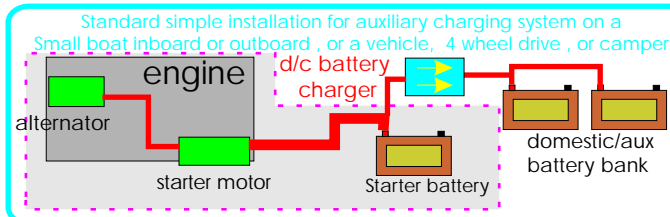
In a nutshell it charges your extra battery system about 5 times faster than it would otherwise charge, doubles the useful power subsequently available, and increases battery life by de-sulphating them. For best effect use open lead acid batteries, avoid gel, sealed and A.G.M.. batteries (see 'which is the best battery' article in the brochure).

Advantages of this unit.

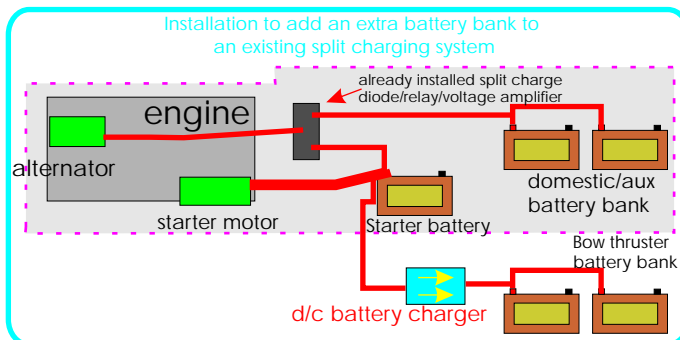
- 1) **installation:** it does not get any easier, simply connect to your starter batteries, and to your domestic battery, job done, makes for easy and low cost installation.
- 2) **no direct connections to the standard engine alternator**, or to the

This unit can be used to charge extra battery banks from Boat Inboard engines, Boat Outboard engines Vehicle engines (cars/lorries/vans) and Generator engines.

The dotted line shows the original system and shows how simple it is to connect the bat-bat charger



This is the most common and simplest installation and is simply connected to the starter battery. In order to connect up the d/c battery charger then all you do is connect one wire from the auxiliary battery banks to the starter battery, the starter battery stays between 13-14 volts (within its limits) and the domestic battery goes up to 14.4-14.8. In order to put a good fast charge into the auxiliary batteries, this is especially good if the battery bank to be charged is not close to the starter battery, such as things like bow thrusters, or batteries in the boot of cars or lorries.



This option shows a typical split charge system on any boat or camper vehicle, already installed and that has been using advanced alternator regulators or any other advanced charging system. Assume that then an extra battery bank is required, such as a bow thruster or radio battery bank or a generator, for ease of installation simply drop on a d/c battery charger.

outboard (if used on an outboard), thus on new installations there is no extra wiring for a split charge system.

3) **ensures the engine battery is maintained and well looked after**

4) **multiple units can be used**, for example if you have a 60 amp alternator, and 3 battery banks (engine, domestic, and bow thruster) then 2 of these can be used to run the bow thruster and the domestic system. The internal programs will adjust their charge patterns to accept the other unit and ensure only the excess power is used and the primary system is not placed in jeopardy.

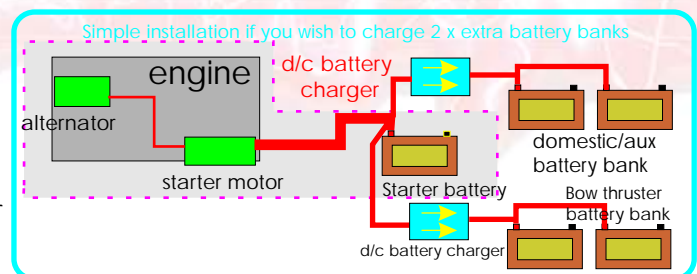
5) **ensures there is no voltage rise on the engine management system**, to ensure no alarms or damage to the system be it a outboard, or a car, or a boat.

6) **no vehicle warranty issues as you are not connected to the main system**

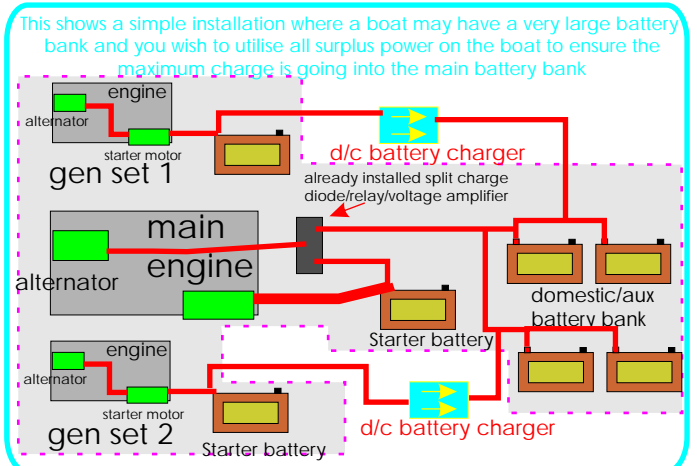
How does it work?

The unit monitors the engine start battery, the unit will not start until the battery voltage exceeds 13 volts then it waits for 2.5 mins, to ensure that some charge is replaced after engine start, it then pulls the engine battery down to no less than 13 volts, this enables the engine battery to still receive a charge and ensures the alternator works at its full potential. To further ensure the engine battery is O.K. Other features included in this system are remote control option, alternator temp sensing, battery temp sensing, ignition feed (if required), automatic start and shutdown. Its extra features and charging curves (software program) are very similar to the alternator to battery charger.

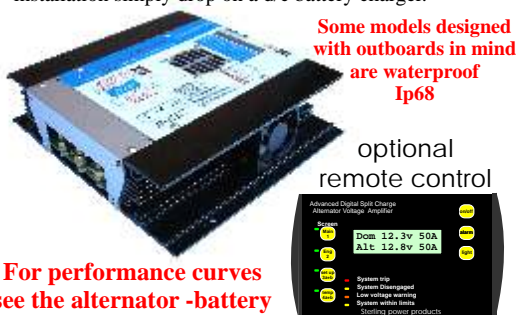
For a new, extremely efficient way of charging on your boat using these products, go to our web site, go to downloads and look at Point charging. www.sterling-power.com - with out doubt, the future of charging on boats.



This option shows a situation on many boats or camper vehicles where there may be 3 x battery banks, simply put 2 x d/c battery chargers on, and they will ensure both banks are catered for with no problem. the fact that one battery bank is further away than the other will make no difference



This option shows a standard split charge system on any boat or camper vehicle, already installed and that has been using advanced alternator regulators or any other advanced charging system. Then you find that you wish to supplement the marine house battery bank by charging from as many auxiliary charging systems as you can. For example, if you are running a gen set for 4 hrs per day you may as well put as much power as possible into your main, large house battery bank. Any source can be used, you can even use this system to charge from an old type battery charger. If, for example, you had a old constant voltage battery charger and you wished to convert it to a constant current type then simply put one of these on the output. Alternatively, if you have a single output charger and want a dual output then simply add one d/c charger to make a dual charging system.



Some models designed with outboards in mind are waterproof Ip68

optional remote control

DC Volts in	DC Volts out	Amps/in	Size	Weight	Code	Price inc vat
12V	12V+	100	200 x 270 x 70mm	2.5kg	BB12100	
12V	12V+	50	190 x 100 x 70mm	1.5kg	BB1250	
24V	24V+	50	200 x 270 x 70mm	2.5kg	BB2450	
12V	24V	50	200 x 270 x 70mm	2.5kg	BB122450	
24V	12V	25	470 x 250 x 90mm	2.5kg	BB241230	
Remote control				0.5kg	BBRC	

Pro Power Distribution

D/C High Powered Fused Distribution Box

This new product is designed to ensure your D/C electrical distribution system on boats and specialist vehicles is both very safe and compact. The clear plastic cover makes it easy to see the green L.E.D.s indicating live circuits and the red L.E.D.s indicating failed circuits. In the event of concerns about excess power being used by the L.E.D.s, a simple link can be removed to kill all the green L.E.D.s (that would otherwise be on all the time) but leave the red (fuse blown warning) L.E.D.s active (but only on in a fault condition). Other interesting features include a alternator fail safe blow fuse, the alternator fuse can safely blow but offer the alternator an emergency link to prevent the alternator's regulator from being damaged due to the loss of a battery link, this output can also be used for other purposes if not being used for an alternator

The unit has been designed with 2 main markets in mind;

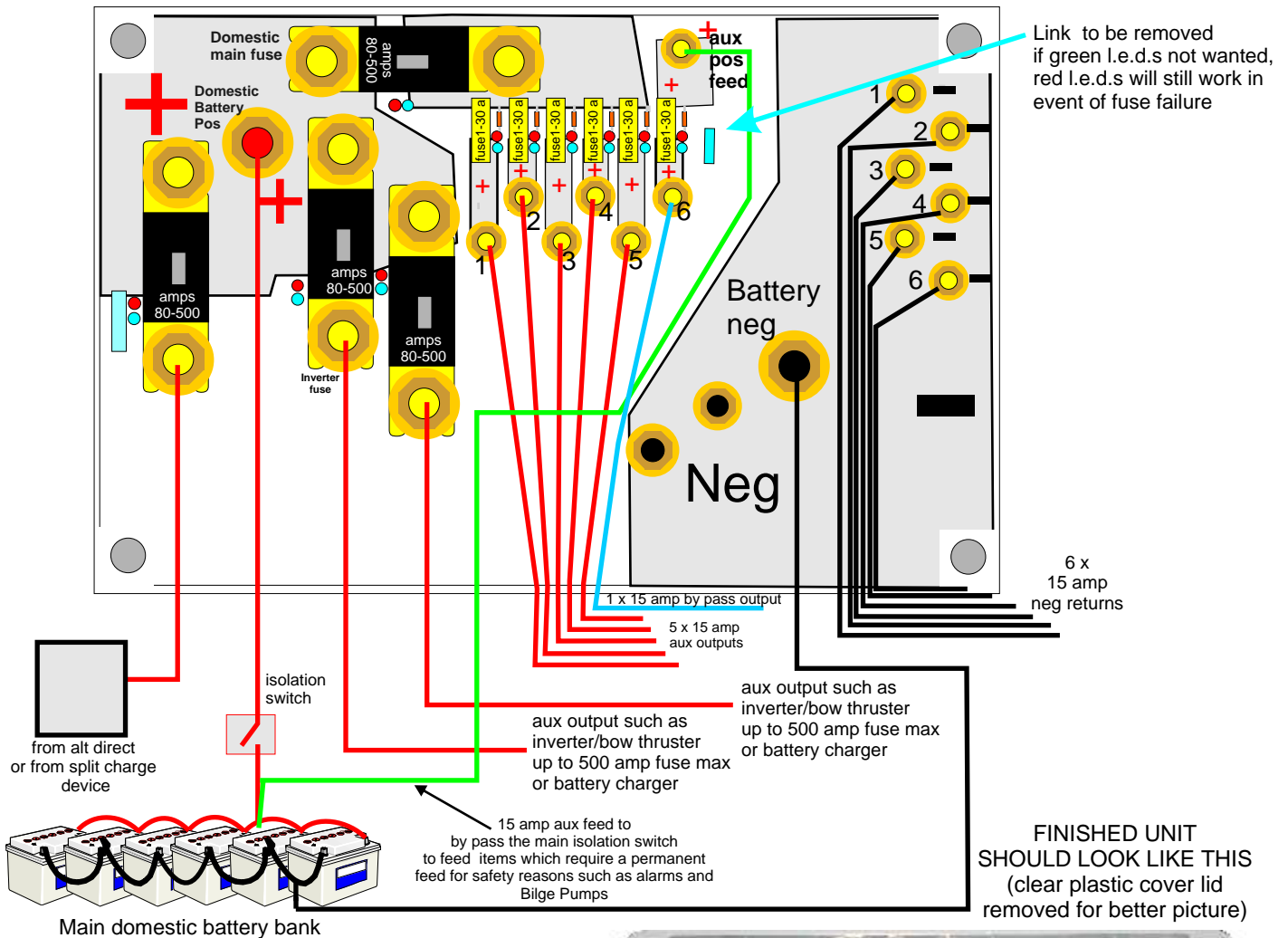
1) Retail market, for existing boats/specilist vehicles, this box can bring your old system up to a much more modern and safer specification. Fit close to the domestic battery bank and all your fuses are now inside the recommended distance for modern safety standards, it also puts all your fuses in the same area and allows easy testing of faulty circuits.

2) O.E.M. market. if used on a system from scratch, this will reduce the wiring time of any system, replacing the need for many individual parts

needing to be fitted and connected whilst also standardising the wiring arrangements saving a lot of time and therefore translating into money.

Key features include

- 1) 3 x ANL fused outputs from 80-500 amp ability (fuses purchased extra, see our gold ANL for the fuse required).
- 2) 5 x 15 amp continuous outputs with 30 amp fuses (supplied) with one 300 x fuse supplying that section
- 3) 1 x 15 amp 'maintained' output with 30 amp fuse , extra aux d/c feed position to bypass main feed in event of ancillary equipment requiring a permeanet feed even if the main battery bank is isolated, such as alarms or bilge pumps.
- 4) Emergency alternator link in the event of the alternator fuse blowing (this prevents the alternator being damaged).
- 5) Green L.E.D.s to show the circuit is live (L.E.D.s on all the time when battery not isolated, can be switched off, if preferred, by removing a link).
- 6) Red L.E.D.s to show when fuse has blown (only on when fuse has blown).
- 7) Cable guides for the low power cables, plus cable ties to be tightened when wiring complete to keep wires tidy and secure.
- 8) Small footprint very compact design
- 9) Most negatives returned to box to enable easy circuit checks

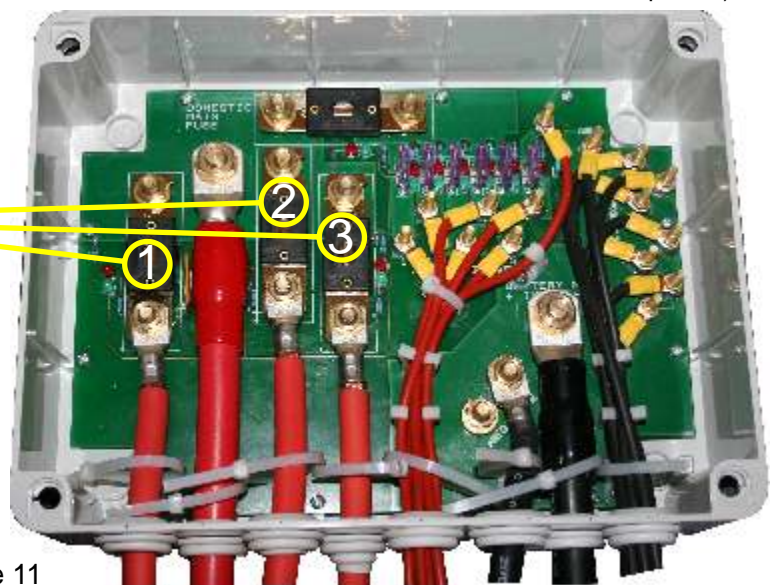


D/C High Powered Fused Distribution			
Size	Weight	Code	Price inc vat
300 x 220 x 120 mm	1.5kg	PPD500	

3 optional GANL fuses required, please select the required sizes



Fuse	Code	Price inc vat
80 amp	GANL80	
100 amp	GANL100	
150 amp	GANL150	
200 amp	GANL200	
250 amp	GANL250	
300 amp	GANL300	
350 amp	GANL350	
400 amp	GANL400	
500 amp	GANL500	



0.0 volt drop mutable output alternator splitting systems

Pro Split R
Single and twin alternator units

Zero Volt Drop Intelligent Digital Alternator Distribution System.

This product uses a micro processor to monitor the multiple battery bank outputs which are to be charged by an alternator, it ensures the batteries are all charged in conjunction with each other and prevents any back feed through the device in the event of high loads on one battery bank. The system also has the ability to disconnect the alternator and individual battery bank outputs in the case of problems caused by the alternator or other power items in the system. It does all this and still offers only a max voltage drop of less than 0.01 volt, much less than any so called 0 volt drop mosfet/diode system. Many so called 0 volt drop systems simply do not come close, the Mastervolt battery mate is as high as 0.6 volts at full power (where it counts) while the Sterling is at 0.09 volts, a 500% performance improvement over the Mastervolt Battery mate unit and about 1100% over a standard diode

How does the unit work

This unit on the surface looks like a simple device, however, this is a very complex software control device with in excess of 1000 lines of code. Under normal operation the unit has a simple operating mode. Like all Sterling product, however, being engineers we are not only concerned about normal operation conditions we like to build into our products as much safety and control as possible to both protect your electrical system and ensure the available power is directed to where it is required most and also ensuring that the engine's battery always has the priority charge.

What is the problem? Voltage drop across splitting systems (such as diodes) will cause poor performance when trying to charge batteries. This can be easily compensated for by using things like advanced alternator regulators or battery sensed alternators, however, this in itself can cause problems (particularly with prolonged use and sealed batteries such as agm and gel) with other batteries in the circuit, i.e. an over charge can take place, as explained in the diagrams below.

All boats have at least two battery bank outputs; some have three. These tend to be the engine start battery, the domestic battery bank (please note that if you join three or four batteries together in your domestic battery bank it is still one battery), and the bow thruster battery. Having introduced 2-3 battery bank outputs onto your boat, the problem then is how do you charge them from one alternator source (or two alternators which I will discuss later).

To understand why this product was designed then first we must understand the problem.

Example 1 shows a typical split charge diode installation with a standard alternator with no advanced regulator or battery sensing reg. The test assumes a 60 amp alternator, the diode is a 70 amp rated and there is average cable between the alt and the battery bank. The alternator voltage is assumed to be about 14.2 volts, however in real life this could vary from 13.9 to 14.8 volts depending on the manufacture and the internal regulator fitted to the unit. Important to note on **example 1** is the fact that the alternator produces 14.2V at the alt but, by the time it gets to the domestic battery, there is only 12.8V left, this is an appalling voltage and would result in you having extremely bad charge performance at your battery bank. However, note that the engine battery is at 13.6V (this higher voltage is not an issue in this case but the phenomenon will cause a problem in later examples) this is because that at 60 amps the voltage drop across the diode to the domestic battery is 1 volt, however, because the starter battery is almost full it is only drawing a few amps from the alt and so its voltage drop is only going to be about 0.4 volts (remember the voltage drop across a diode is not linear it is proportional to the current flow, i.e. the more current flow through a diode the greater the voltage drop. Conclusion in example 1, there is no danger to anything but there is an appalling low charge voltage presented to the batteries making the charging system grossly ineffective.

Example 2 is replacing the standard reg with a battery sensed reg, this

in effect says to the alternator, give me 14.2 volts at the domestic battery bank (or at the end of the battery sensed cable) regardless of what voltage the alternator has to produce to achieve this goal. This will improve charge at the domestic battery a great deal, i.e. you can see that the voltage will rise on the battery from 12.8 in example 1, to 14.2 in example 2. However, when the voltage is checked through the system (and taking into account the voltage drops across the diodes) the engine battery voltage is now 15.2V, this would rise even more if the cables were longer i.e. if you had 4 or 5 meters of cables then the voltage drop in the cables could be up to 1 volt, this would drive up the starter battery by another 1 volt etc etc. Conclusion; the starter battery should be open lead acid type as it is going to gas a little. In the short term the batteries would simply gas a little, and a regularly maintained battery would be ok. However, with a sealed, gel or agm type any gassing will destroy these batteries.

Example 3 is pretty much the same as example 2 except a modern advanced regulator will push the batteries up to 14.8 and in some cases the new calcium batteries could go as high as 15.1 volts. This simply adds another 0.6 volts onto example 2 with the same conclusions only worse.

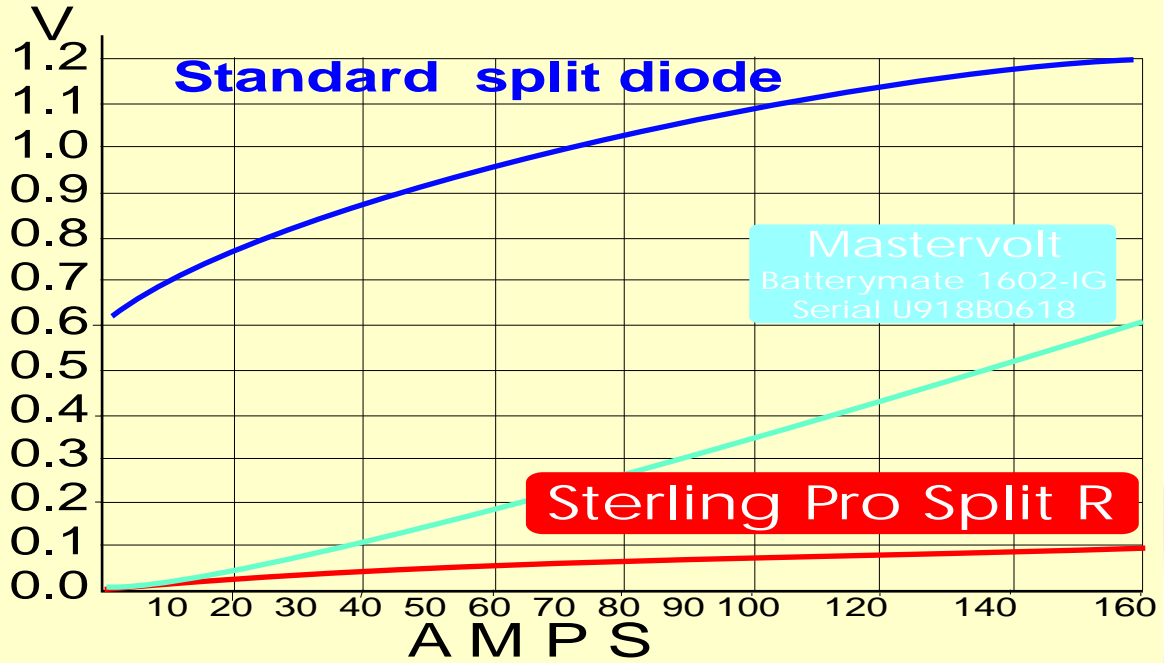
The solution: **Example 4** If the voltage drop across the splitting device could be eliminated then there would be no excessive rise in voltage on the starter battery, this way the gassing/high charge rate of the secondary would be the same as the domestic battery bank and so be under control. This would prevent excessive gassing taking place and causing excessive water loss in the starter battery. It also has many added features associated with this new technique.

Other advantages of the Zero Volt Drop Intelligent Alt Distribution System

- 1) distributes the most power to the battery bank which demands it
- 2) isolates a battery bank when there is any attempt to back feed the power from the full battery bank to a more demanding battery system
- 3) isolates all full battery bank outputs except the main load battery in the event of a massive load on any battery bank
- 4) isolates the main alternator from all the batteries in the event of a failure of the alternator's own regulator. This prevents the batteries from boiling
- 5) isolates any battery bank which tries to back feed a high voltage from a different source. i.e. if there was a defective battery charger on one battery bank trying to back feed into another battery bank then the unit would disconnect that battery bank to save the others.
- 6) L.E.D. display shows which channels are in use and which are not.
- 7) Overload design, for example our model rated for a 180 amps is actually continually rated for 240 amps with overload in excess of 2000 amps
- 8) Fail-safe, in event of unit failure the engine start battery and alt remain connected, ensuring the safe running of the boat/vehicle. Prioritizes the engine start battery charging over all other battery bank outputs

Competitors products: various other companies claim they have 0 volt split charge systems, however the so called transistors / mosfets splitters when under load are only about 50% better than the standard low cost diodes, whereas the Sterling is 90% better, we actually have a 0.09 volt drop under full load conditions as opposed to 0.6 v which the Mastervolt product has, making our product over 500% more effective. Plus we offer all the extra functions as described above which the transistor/ mosfet, products can only dream about

Voltage drop across splitting systems



twin alternator unit 4 output

For 2 or more alts either use the twin unit or Multiple alternators can be used on the single inputs as long as the total amps off the combined alternators does not exceed the rating of the product

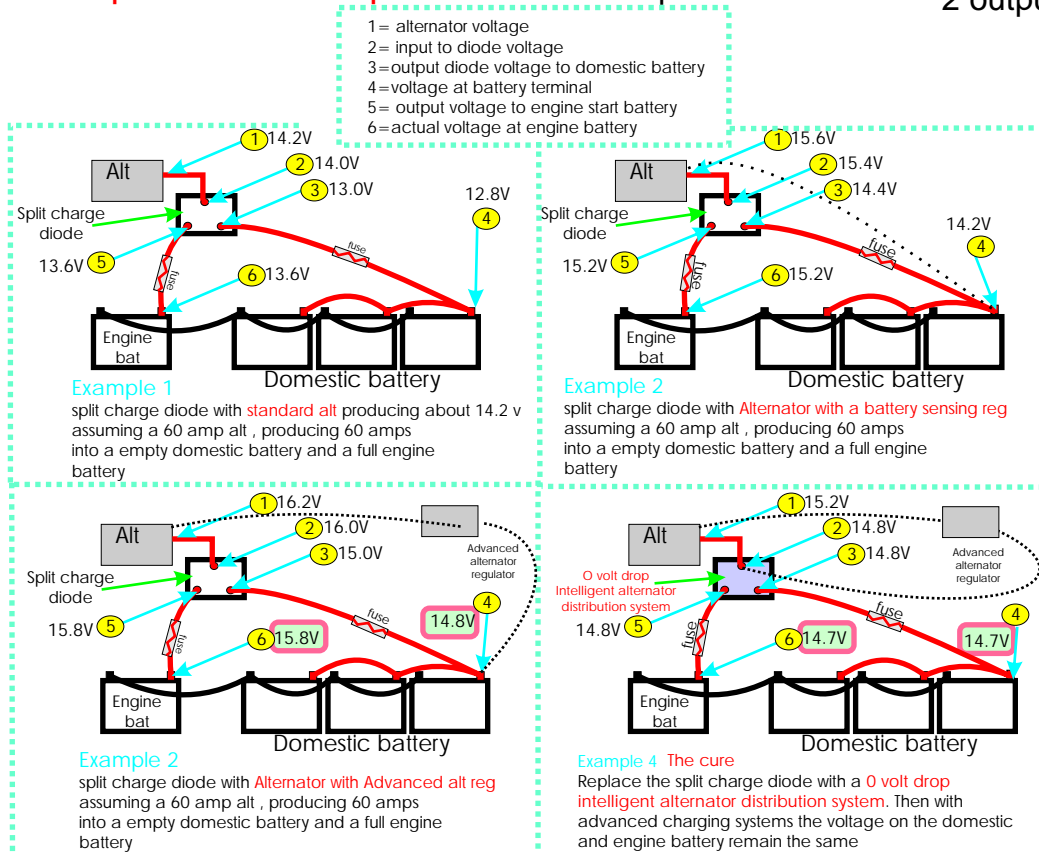
Alt volts	Max alt amps	Output bat bank	Unit size mm	Unit weight kg	Sterling part nos	Retail price inc vat
12 v	120	2 out	150Wx80Dx120L	0.6	PSR122	
12 v	180	2 out	150Wx80Dx140L	0.7	PSR182	
12 v	230	2 out	150Wx80Dx155L	1.0	PSR252	
12 v	120	3 out	150Wx80Dx130L	0.9	PSR123	
12 v	180	3 out	150Wx80Dx175L	1.0	PSR183	
12 v	230	3 out	150Wx80Dx220L	1.3	PSR253	
12v	twin 130	4 out	150Wx80Dx295L	1.8	PSRT134	
24 v	60	2 out	150Wx80Dx120L	0.6	PSR62	
24 v	100	2 out	150Wx80Dx140L	0.7	PSR102	
24 v	150	2 out	150Wx80Dx165L	1.2	PSR152	
24 v	240	2 out	150Wx80Dx250L	1.7	PSR242	
24 v	60	3 out	150Wx80Dx150L	0.7	PSR63	
24 v	100	3 out	150Wx80Dx175L	1.0	PSR103	
24v	150	3 out	150Wx80Dx220L	1.3	PSR153	
24v	twin 80	4 out	150Wx80Dx295L	1.8	PSRT84	



3 output unit

2 output unit

Point zero volt drop / IP66 waterproof



ProConnect series of battery charging link connectors

ProConnect I

Ignition feed/signal feed relay:

This range of low cost low signal activated relays is the simplest in the range, it offers the ability to link as many battery banks as you wish to the starter battery to link and therefore charge different battery banks on a boat/vehicle when an engine is running.

Ideal applications: Boats with outboard motors and simple cabin batteries with no heavy loads on the cabin batteries, small vehicles/boats with auxiliary battery systems with no loads on the auxiliary battery bank in excess of the rating of the relay so as not to overload the relay circuit.

Its limitations: There is no current limit with this type of device, so avoid using it on a system which has a high secondary battery load, such as a big inverter, anchor winch or bow thruster, as the surge currents associated with this type of equipment can destroy the unit (see current limiting relays for this application).

Also there is no low voltage shut off, ie in the event that the secondary battery load is higher than the alternator's ability to cover it (for example at low R.P.M the alt would not product full power) then not only will the axillary battery/domestic battery be drained but so would the starter battery. A common example of this would be a high power stereo system on a vehicle where, at tick over in a town, the alternator cannot cover the power used, so when the vehicle is switched off the starter battery could be to low to restart the engine.

Advantage over a standard relay. A standard relay has a activation feed via a cable, this feed takes about 1 amp to run, this adds the 1 amp to where you are taking the feed from, either the d+ on the alternator or key switch or oil pressure switch. This can place enough extra load on these circuits to cause a problem. there is also the secondary problem of voltage drop in the ignition feed cable affecting the relay. This product, even though it also needs an ignition feed cable it simply uses the feed as a signal and takes no power from the ignition feed wire, the signal then activates a internal fet which in turn activates the relay from it own power source internal. This also has the advantage of not suffering from voltage drops in the feed line. The time delay prevents the high load on the starter battery on start up from destroying the relay.

This unit is also water resistant and in a much safer package form. The package also contains anti-spark protection to help reduce the effect of back EMF from open circuiting the relay under heavy loads, without this relays will weld close if the unit is switched off under high current pass applications. The connection terminals are also high quality brass nuts and bolts and not poor quality crimp connectors which are not suitable for high sustained current flow.

Voltage Sensitive Relays:

ProConnect VS

This product would be regarded as the next level up from the signal feed relay (as above), the main difference being that it is totally automatic, this relay does not require a feed to operate, it works on monitoring the input voltage to the device (usually the starter battery or battery bank with other charging source such as a battery charger or wind gen), when this voltage exceeds 13.3 volts the processor makes the assumption that the alternator/battery charger or other power device is active and as such it will automatically engage the relay to connect the main battery bank to the auxiliary battery bank and so charge the aux battery. Conversely, when the voltage drops below 12.9 volts the processor in the relay assumes that either the engine has been stopped or the load on the aux battery is pulling the starter battery down too much and for safety reasons it should be isolated. In a nut shell this is easier to install than the above and is smarter, however, it suffers from many of the same limitations as the standard signal relay

Ideal applications: See the above signal relay applications, also ideal for charging a secondary battery bank from a battery charger which has only one output such as a combined inverter charger. The starter motor interlock connection prevents the starter motor current being pulled through the relay and damaging the relay.

Its limitations: See the above limitations for the signal relay. Another major problem with standard relays is their ability to switch off under high load. The main job of a voltage sensitive relay is to sense any major current being taken out of the starter battery (primary) and to stop it. For example, if we take a typical 12V boat system with an 80 amp alternator and install a standard 80 amp VSR on the engine starter battery bank to charge the secondary battery (domestic battery bank, anchor winch or bow thruster battery bank). On engine start up the alternator will raise the voltage on the starter battery and this will engage the relay to charge the secondary battery bank (so far so good). However, for the sake of argument say the secondary battery bank is discharged (ie first thing in the morning) and then someone switches on a 2000 watt inverter, or a bow thruster or the anchor winch, these items will attempt to draw 200 amps + from the secondary battery bank. However, because the secondary battery is nearly empty, the load (the 200 amps) will automatically attempt to draw this current from the highest voltage source which, in this case, would be the starter battery bank, obviously we do not want this to happen as we do not want to drain the starter battery or burn out the 80 amp relay or even worse set fire to the cables as the cables would be rated to take 80+ amps and you are now trying to pull 200 amps plus down these cables (a fire in the making). In theory the large current flow through the VSR will drop the starter battery voltage and so trigger the relay to open circuit and so switch off this circuit stopping the drain and saving the day. However, a relay has 3 main ratings, for example an 80 amp relay can take 80 amps all day no problem, (hence its continuous rating) and has a short term over load of about 400 amps for about 1/10th sec. It has a third rating, however, that is much more important; that is the maximum current it can open circuit at. The assumption by the public is that an 80 amp relay can open circuit at 80 amps, but that is not so, it has an open circuit current rating of about 20-30 amps. And so the problem becomes apparent, the high load on the secondary battery system (in the above example) causes an instant load of 200 amps + on the relay (that's ok, it can deal with this for a split second) then the control circuit attempts to open the relay to stop this discharge, then BANG you open the relay with 200 amps going through it (with an open circuit rating of about 25 amps) and so you cause a large back E.M.F. that, if you're lucky, will vaporize the contacts blowing them in to small pieces and open circuit the relay destroying the product. To reduce this effect, Sterling puts anti back E.M.F. spark reducers on all relay products,

Current limiting Voltage Sensitive Relays

ProConnect CLR

These relays have built in current limiting, in a nutshell you can do what ever you want with them, if you overload them they simply switch off safely. The trick with a relay is not to open circuit it when it is overloaded, but to remove the load, then open circuit the relay within its rating. With a current limiting VSR in an overload situation such as the example in the section above (Voltage Sensitive Relays) the 200 amps will surge through the relay for a split second (within the relay's capability), then the built in current limiting device will see this overload and reduce the current from the dangerous 200+ amps to a very safe 6 amps, the relay will then safely open circuit with a 6 amp load and not a 200 amp load, and so protect the relay and your installation. Once the high load demand has been removed then the relay is safe to re-engage and continue doing its job.

Current limiting Voltage Sensitive Relays can be used for different things other than charging batteries, depending on what the setup is in the relay program. The Sterling unit can be used for the following depending on which of the preset programs you chose to use. The program can be altered using a magnet and run it across the unit to activate different performance requirements

The Sterling unit has 3 programable settings, you select which function you require by passing a magnet over the unit and selecting the program you require

Function 1. Charging activated by starter battery voltage increase (engine on) This is the most common setting and the factory default setting. This setting also does not have an ignition feed requirement. This connects the primary and secondary based on a voltage in excess of 13.3V being sensed on the primary battery only (the engine starter battery). The 2nd battery bank, once connected would only disconnect when both battery banks drop below 13.0 volts on both sides. The 13V safety threshold is still activated to protect and separate the batteries if, or when, the drain that invoked this function (voltage drops below 13 volts) once the unit has tripped, will not re-engage until the voltage on the primary battery bank (the engine start) has exceeded 13.3 volts again. **No ignition feed required on this setting**

Function 2. Charging either way, based on a voltage rise on either side of the unit. This function will close the relay at 13.3 volts sensed on either side of the relay, a good example of this would be the use of a combi inverter charger on the domestic battery bank, because most combi's only have a single output charging line (to the domestic battery bank) then with this function the unit will charge from the combi to the starter battery bank (in effect giving you 2 outputs from the battery charger) when the combi is on, but also charge from the alternator to the domestic battery bank when the combi is off. In either mode the unit still has the 13.3V on and 13V off mode and the current limit function. **No ignition feed required on this setting**

Function 3. Charging batteries one way only This function allows a charge to flow from the alternator, or battery to battery charger, or any other charging source etc to a secondary battery bank, **but only when the engine is running**. In effect this mode only allows current flow from the primary source to the secondary, and will continue to flow until either there is an overload threat or a low voltage threat to the primary battery or the engine is shut down. This function requires an extra wire to the unit, an ignition feed, that informs the unit if the engine is running or not. **None of the other functions require a ignition feed**

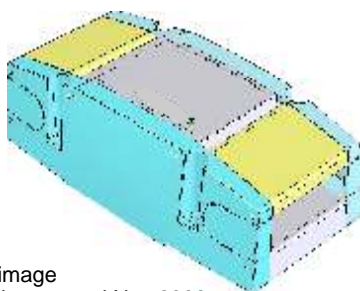
Other advantages of a current limiting VSR

- 1) 0.0 volt drop across the device ensuring a more even charge.
- 2) cables can be thinner as the overload is contained and reduced automatically not only protecting the relay but also the cables.
- 3) No fuse required to protect the product, the product can even deal with a dead short and switch itself off with no damage
- 4) ignition protected SAE J1171
- 5) IP66 water proof
- 6) Can be used in different charging modes
- 7) In the unlikely event that the pre programmed voltage settings are not suitable, then the voltages are adjustable using the magnetic reed switch

What size of relay do I need?

There is no point purchasing a relay which is too small for the job as it will simply protect itself and shut down leaving the system ineffective. To size the correct unit, ensure that the unit is equal to if not a little larger than the main charging source. This is very important if charging a main domestic battery bank (in conjunction with an advanced regulator) where the full alternator current flow will be very common, and so if you have a 110 amp alternator you should purchase the 120 amp Current Limiting Relay unit. However if you are only charging, for example, an engine start battery for a generator where high current flow is extremely unlikely then a lower relay rating would be fine.

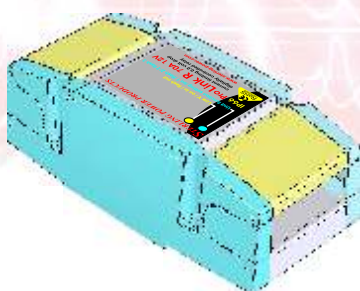
ProConnect I Ignition feed/signal feed relay:



Rendered image
finished unit expected Nov 2008

Ignition/signal Relays					
DC Volts	Amps	Size	Weight	Code	Price inc vat
12V	80	120 Lx55 Wx40 H mm	0.025kg	RS1280	
12V	160	120 Lx75 Wx40 H mm	0.05kg	RS12160	
12V	240	120 Lx100 Wx40 H mm	0.075kg	RS12240	
24V	50	120 Lx55 Wx40 H mm	0.025kg	RS2450	
24V	100	120 Lx75 Wx40 H mm	0.05kg	RS24100	
24V	150	120 Lx100 Wx40 H mm	0.075kg	RS24150	

ProConnect VS



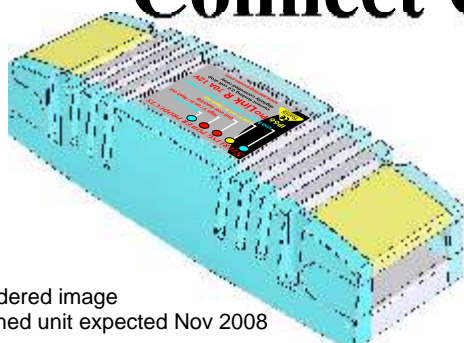
Rendered image
finished unit expected Nov 2008

Voltage Sensitive Relays:

Voltage Sensitive Relays Digitally controlled					
DC Volts	Amps	Size	Weight	Code	Price inc vat
12V	80	120 Lx55 Wx40 H mm	0.025kg	RVS1280	
12V	160	120 Lx75 Wx40 H mm	0.05kg	RVS12160	
12V	240	120 Lx100 Wx40 H mm	0.075kg	RVS12240	
24V	50	120 Lx55 Wx40 H mm	0.025kg	RVS2450	
24V	100	120 Lx75 Wx40 H mm	0.05kg	RVS24100	
24V	150	120 Lx100 Wx40 H mm	0.075kg	RVS24150	

V.S.R ratings, for the 70 amp model, for 140a x 2. for 210 a x 3
 continuous operating current of the VSR at 30 deg c = 70 amps
 continuous relay operating current at 90 deg c = 60 amps
 instant overload current = 650 amps
 current limit after shut down current = 6 amps
 at rest power consumption less than 1ma

ProConnect CLR



Rendered image
finished unit expected Nov 2008

Current limiting Voltage Sensitive Relays :

Current Limiting Voltage Sensitive Relays Digitally controlled					
DC Volts	Amps	Size	Weight	Code	Price inc vat
12V	70	170 Lx55 Wx40 H mm	0.025kg	CVSR1270	
12V	140	170 Lx 75 Wx40 H mm	0.05kg	CVSR12140	
12V	210	170 Lx100Wx40 H mm	0.075kg	CVSR12210	
24V	50	170 Lx55 Wx40 H mm	0.025kg	CVSR2450	
24V	100	170 Lx75 Wx40 H mm	0.05kg	CVSR24100	
24V	150	170 Lx100Wx40 H mm	0.075kg	CVSR24150	

Which model best suits my needs

1) The first part is easy, what is the max size of your alternator or charging device, ie do you have a 90 amp alternator or a 100 amp charger charging the primary, this means that the secondary battery could be subjected to that load so the relay must be able to comfortably handle that sort of current, continuously. It would be wise to give the relay a good 10% comfort zone, ie always up size the relay if the charging source and relay are the same, ie if you have a 80 amp alt and an 80 amp relay then go to the 160 amp relay option.

2) Next its cost of installation and ease of installation, if you are fitting the unit and access to ignition feeds etc are simple then the **Ignition Feed** system should be entertained, however if not then the **Voltage Sensitive Relay** version is much simpler to fit and totally automatic.

3) The last but most important aspect is safety. The most important thing here is to establish what the maximum possible load that could be placed on the secondary battery bank when the relay is engaged. ie a large inverter/anchor winch, bow thruster. Remember what ever load you put on the secondary battery will have a % of this load transferred to the primary battery depending on how full the secondary battery is, this could range from a few percent to 100 percent, so its important the relay system can deal with this high load without damage, if there are large potential loads such as hundreds of amps then the only way to do this is using a **Current limiting voltage sensitive relay**. because when exposed to excessive currents, the current limiting models simply and safely shut down until the excessive current is removed, ie switched off, then they can re instate themselves and carry on .

STERLING QUICK CHECK LIST

	Pro Connect I	Pro Connect VS	Pro Connect CLR
0.01 volt drop	●	●	●
Ignition feed	●	●	●
Water proof to IP66	●	●	●
High overload	●	●	●
Emf spark arrester	●	●	●
1 l.e.d. information display	●	●	●
Nut and bolt connector	●	●	●
No ignition feed voltage drop	●	●	●
Suppression diodes across relay to prolong life	●	●	●
Time delay to prevent engine starter damage	●	●	●
Automatic voltage activation		●	●
Automatic voltage de activation		●	●
Protects primary battery from discharge		●	●
Emergency auxiliary forced activation		●	●
High battery voltage trip protection		●	●
2 led information display		●	●
Starter motor interlock to isolate relay on start		●	●
Current limiting protection			●
Voltage adjustment parameters settings			●
Charging and sense modes adjustable			●
5 l.e.d. information display			●
Can deal with a dead short without external fuse			●

ProPower Q

The Professionals Choice
Quasi Sine Inverter s
100 -5000 watt

General opinion over the last few years was that the Quasi-sine-wave inverter was dead, and the pure sine-wave inverters would rule the world (an opinion not shared by Sterling) sales of quasi-sine-wave inverters have continued to out-grow sales of sine-wave, proving that there is plenty of life left in this technology. The principle reason is that most of the equipment such as mobile phones, t.v.s drill chargers and all that type of equipment which used to have a problem working with quasi-sine-wave tends now work fine on quasi-sine as the effected equipment now tends to use switch mode power supplies in there design which works fine with quasi sine wave . This meant that rather than the problems getting worse over the years the problems have diminished, however this is not to say that the odd micro wave , drill vacuum cleaner would not work (if there is a thyristor control circuit employed then this can still be a issue) but there is no question this is becoming more rare as the years go past, plus its still usually a lot cheaper to replace a £ 35 microwave to a different model which will work rather than spend £ 700 on a sine wave model to make it work . Sterling has invested in a new range of quasi-sine inverters because they are smaller, lower cost, offer better performance, are more efficient and more reliable than sine-wave. We at Sterling have always found the quasi-sine-wave inverter more than adequate for general requirements in boats and vehicles. There is still the odd appliance, such as washing machines, where quasi-sine-wave inverters simply do not work, but all in all they do a great job - especially considering their cost. With this in mind, we have made a new range of DIGITAL quasi-sine inverters called the **Pro Power Q**. The idea behind this was to push forward this technology and bring in some new features. The most obvious change in this new inverter is its style, tough aluminum extrusion with great looking plastic end caps, euro and British sockets are on all this range ,enabling the unit to be compatible across Europe without problem. The new extrusion design has allowed us to reduce the size of the 1000-2500 watt units by nearly 40% , but still offer their full power and even better performance over the previous models. If you also require a battery charger then look at our new **Pro Combi Q** range

ALL THESE INVERTERS ARE
e marked to 95/54/EC



150 watt oval style is avaiable in 2 versions
I12150 = this model is the most popular with a universal socket which can be sued for all different plugs round the world.
I12150CT = this model has a English socket on one side and a German style socket on the other, this unit tends to be used where companies want to have the inverter standard rated as a mains power source, where in actual fact its a isolated power supply

1000-2700 watt
inc remote control
and 10 mtrs cable



I12100

I12170T
Fan cooled

New turbo coke can inverter:
The popular 100 watt coke can style inverter which can lie flat or fits in a standard coke can holder in cars / lorries / boats. now has a new big brother which keeps the same convenient style and application, but now has a internal fan to keep it cool, the end result is it can produce a comfortable 170 watts. The new turbo model is about 20 mm longer and requires either a open cup holder or a cup holder with at least 5 mm larger diameter than the unit to allow air flow

Pro Power Q 230 v 50 hz quasi sine wave inverter 5000 watt not in Pro Power Q style								
DC Volts	Watts	Mains	Hertz	Size mm	Weight	Code	Price inc vat	
12V	100W	230V	50Hz	65 mm dia 145 L	0.3kg	I12100		
12V	150W	230V	50Hz	170 x 100 x 70	0.4kg	I12150		
12V	150W	230V	50Hz	170 x 100 x 70	0.4kg	I12150CT		
12V	170W	230V	50Hz	65 mm dia 160 L	0.3kg	I12170T		
12V	350W	230V	50Hz	120 x 150 x 65	1.kg	I12350		
12V	600W	230V	50Hz	150 x 150 x 65	1.3kg	I12600		
12V	800W	230V	50Hz	180 x 150 x 65	1.8kg	I12800		
12V	1000W	230V	50Hz	180 x 250 x 100	2.0kg	I121000		
12V	1800W	230V	50Hz	260 x 250 x 100	4.0kg	I121800		
12V	2700W	230V	50Hz	390 x 240- x 100	5.0kg	I122500		
12V	5000W	230V	50Hz	460 x 50 x 190	10.0kg	I125000		
24V	100W	230V	50Hz	65 mm dia 145 L	0.3kg	I24100		
24V	150W	230V	50Hz	170 x 100 x 70	0.4kg	I24150		
24V	150W	230V	50Hz	170 x 100 x 70	0.4kg	I24150CT		
24V	170W	230V	50Hz	65 mm dia 160 L	0.3kg	I24170T		
24V	350W	230V	50Hz	120 x 150 x 65	1.kg	I24350		
24V	600W	230V	50Hz	150 x 150 x 65	1.3kg	I24600		
24V	800W	230V	50Hz	180 x 150 x 65	1.8kg	I24800		
24V	1000W	230V	50Hz	180 x 250 x 100	2.0kg	I241000		
24V	1800W	230V	50Hz	260 x 250 x 100	4.0kg	I241800		
24V	2700W	230V	50Hz	390 x 240 x 100	5.0kg	I242500		
24V	5000W	230V	50Hz	460 x 250 x 190	10.0kg	I245000		

110 volt @ 60Hz for UK Building Sites or USA Market

DC Volts	Watts	Mains	Hertz	Size mm	Weight	Code	Price inc vat	
12V	1800W	110V	60Hz	260 x 250 x 90	4.0kg	AI121800		
12V	2500W	110V	60Hz	460 x 250 x 90	6.0kg	AI122500		
24V	1800W	110V	60Hz	260 x 250 x 90	4.0kg	AI241800		
24V	2500W	110V	60Hz	460 x 250 x 90	6.0kg	AI242500		

Split Charge Systems Facts And Figures

All boats have at least two battery banks some have three. These tend to be the engine start battery, the domestic battery bank (please note that if you join three or four batteries together in your domestic battery bank it is still one battery), and the bow thruster battery. Having introduced 2-3 battery banks onto your boat, the problem then is how do you charge them from one alternator source (or two alternators which I will discuss later). There are four various options employed by boat builders, below are the options with a short explanation giving both the positive and negative aspects.

1) **Rotary switch.** This method is very dated and not now very common on boats. It is recognisable as a large circular switch with four marked positions on the switch. It is marked, off, 1, 2 and both. The good side of this system is it is easy to install. The bad side is that it needs constant human intervention to ensure it works. Failure to operate it correctly will result in all batteries being discharged or not being charged correctly and possible damage to the alternator. They also tend to suffer failure if large prolonged current is passed through them. The spring in the switch can over-heat and loses its tension; this leads to an exponential break down of the switch that manifests in heat. When these switches fail they tend to melt the plastic case (if you are lucky). Simply check the temperature of the switch every so often by touching the back - it should be cold.

2) **Split charge relay.** This system is both dated and extremely dangerous, and more than likely will make your boat fall short on CE requirements, especially if an inverter is used or a bow thruster. The good side is, that it is easy to fit and requires no alterations to the standard engine system, but merely connects the domestic battery bank to the engine battery via a relay, which is energised when the engine starts.

The bad side (and the very dangerous side) is that a relay is prone to over loading. Say, for example, you have a 70 amp relay on your system and a 55 amp alternator, all seems great, but if you fit a 1500 watt inverter which can draw 150 amps and one morning the domestic battery is flat. So, you start the engine to charge the domestic batteries, the 70 amp split charger relay will come on line to enable the alternator to charge the domestic battery bank. Then you load your inverter to 150 amps, the 150 amps will not be drawn from the domestic battery because it is flat but be drawn from the engine battery (which is full). That means you will draw 150 amps up the split charge cable and through the 70 amp relay. If you are lucky you will destroy the relay, if you are not so lucky then you will set fire to the cross over cables, hence the dangerous aspect. The system must be suitable for the purpose for which it is installed this is clearly not. Be warned about split charger systems using relays. If using relays its important to have a massive overload ability

3) **Split charge diodes:** By using a set of diodes on a heat sink, one can ensure no back feed through the diode, thus ensuring that high currents from other battery banks do not flow up the charge lines and cause a fire. This is the most common method by far employed round the world and is the standard in the USA, for 3 reasons, safety, safety and safety, by the way did I say safety. However, all is far from perfect. The big down side with a split diode system is the voltage drop across the diode (in the order of 0.8-1.2 volts), which dramatically reduces the charge rate of the alternator on average by about 70%, however, this can easily be over come using products such as the Advanced Alternator regulator in conjunction with the split diode.

4) **0 volt-splitting systems:** These are electronic devices using a control circuit and driving mosfets. The end result is a very low voltage drop across the splitting system (in the order of 0.04 -0.6 volts) but no reverse current flow is permitted due to the operation of the mosfets. However on standard marine engines it is much more effective to employ the lower cost diode where an advanced regulator is fitted, (see performance below).

5) **0.0 volt splitting system,** The new **Pro Split R** from Sterling has a voltage drop about 1/10 that of a split charge diode and 1/5 that of a 0 volt drop mosfet system. see Pro Split graph below.

Conclusion:

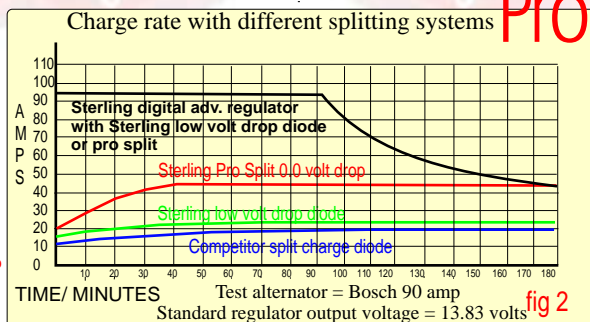
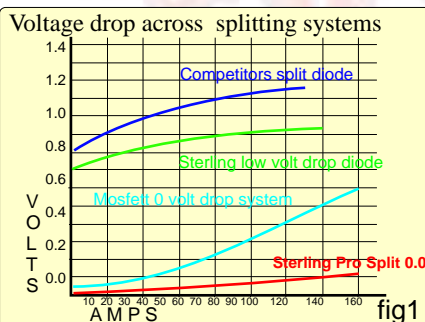
Test 1: From fig1 we can see the voltage drop across different splitting systems. This directly relates to the ability to charge the batteries, the larger the voltage drop across the device, the less effective the batteries charge.

Test 2 shows the clear advantage of using advanced regulators in conjunction with a conventional split charge diode. The advanced regulator automatically compensates for the voltage drop across the diode, plus the high charge 4-step program further increases the charge rate. The illustrated tests were on a 300 amp hour battery bank, but can easily be extrapolated to 400 amp plus.

The best low cost system clearly a standard low cost split charge diode (for safety and cost) or the new Pro Split R and an advanced regulator on the alternator to compensate for the diode faults and charge at the constant current charging curves. This, not only charges 2-3 times faster (on a good installation, but much higher on a bad one) but puts about 100% more useful power into the batteries.

The best system but a bit more expensive is the new Pro Split, (see the next page)

For a twin alternator system, the ideal system is: on the largest alternator, fit direct to the domestic battery bank and attach an Advanced Regulator to that alternator. On the smallest alternator split this with a split charge diode between the engine battery and the domestic (and any other battery bank) and add another advanced regulator to it. This gives maximum charge rate to the domestic batteries



New Split Charge Blocking Diodes 70-200 amps

Sterling Marine has developed a range of low cost split charge diodes. These diodes have enhanced performance over conventional diodes and at a lower cost. The difference is in the devices. All other split charge diode manufacturers use conventional alternator diodes, which at low current flow have about a 0.93 voltage drop. When the full rated current of these diodes is approached, the voltage drop increases to about 0.95 volts. This results in excessive heat and power loss across the diode. For example: A conventional one alternator in and two battery bank out, tested against a Sterling unit had the following results:

	CONVENTIONAL SPLITTERS				STERLING SPLITTER			
AMPS PASSED	30a	50a	60a	70a	30a	50a	60a	70a
VOLTAGE DROP	0.93	0.95	0.97	1.1	0.78	0.75	0.74	0.74
POWER LOSS (w)	27.9	47.5	58.2	77	23.4	37.5	44.4	51.8

Low Voltage Drop Diodes				
Alt Input	Battery Banks	Output	Code	Price inc vat
One	Two	70A	D70A2	
One	Three	70A	D70A3	
One	Two	90A	D90A2	
One	Three	90A	D90A3	
One	Two	130A	D130A2	
One	Three	130A	D130A3	
One	Two	160A	D160A2	
One	Three	160A	D160A3	
One	Two	200A	D200A2	
One	Three	200A	D200A3	

Battery De-sulphation & maintenance device

Connects direct to battery

No external power source

Reverse feeds high frequency pulse into

Battery to blow sulphation off the plates

Prolongs battery life by up to 100%

Rejuvenates older batteries

Sharpens battery response to accept faster charge

Preserves cold start performance

Suitable for use on all vehicles and boats

Pro Pulse De-Sulphation unit		
Size	Code	Price inc vat
100 x 90 x 30 mm	PPI2V	



12V unit
for 24 v use 2 x 12 v

The Pro Pulse is designed to connect to a 12 v battery bank, this unit reverse feeds a small electrical pulse back into the battery which prevents and also reverses sulphation on the battery plates.

By keeping the plates clean and free from sulphation then the battery stays fresh and responsive to charging and discharging.

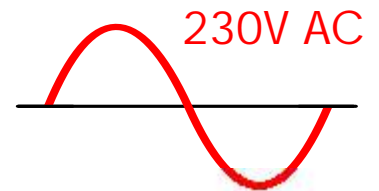
If you have been replacing batteries because they are not holding their charge then in most cases the battery is, in fact in good condition except the plates are sulphated. Sulphation acts like a waterproof coating over the plates preventing the plate area effected being active and contributing to reduction in the battery cell performance. The solution is to remove this sulphation and expose the plate to the battery process again. The Pro Pulse should be not fitted to any battery bank to ensure that sulphation is not only prevented but also reversed and so prolong the life and performance of the battery bank.

This device is not required if you have a Pro Digital battery charger or any other advanced Sterling charging product connected to your batteries as they have a de sulphation cycle built into their software program. This is not a battery charger and it cannot actually charge your batteries it is a de-sulphation device.

ProPower S

ADVANCED **DIGITAL** PURE SINE WAVE INVERTER

150 watt - 3000 watt conventional stand alone inverter,s
1500 watt- 3000 watt with 30 amp a/c crossover switch



The new Sterling pure sine wave, heavy-duty inverter ensures all electrical products run at their very best. It removes all problems linked with quasi-sine inverters such as small black lines on some TV screens. It works perfectly with satellite controllers, runs microwaves at 100% power, works thyristor controlled devices. They all so eliminate problems caused by low cost, non isolated sine wave inverters, such as interference on TV screens, radio and hi-fi noise, and works all CD and DVD players. This unit runs all equipment as per the mains - guaranteed.

The 2000-3000 watt unit is capable of running a standard washing machine and all thyristor controlled devices which cannot be run by quasi-sine . However if there is a washer dryer then the 3000 would be best . The units all come with a standby circuit which offers a 0.2 amp consumption with no load and a low on line loss of about 1.2 amps if power saver not engaged.

The remote control is a standard feature that comes complete with a 10 metre connecting cable.



230 volt Pure Sine Wave Inverters

DC Volts	Watts	Mains	Hertz	Size mm	Weight	Code	Price inc vat
12V	150W	230V	50Hz	210L x 120W x 75H	1.4 kg	SI12150	
12V	350W	230V	50Hz	210L x 120W x 75H	1.6 kg	SI12350	
12V	700W	230V	50Hz	310L x 170W x 80H	3.0 kg	SI12700	
12V	1000W	230V	50Hz	350L x 170W x 80H	3.2 kg	SI121000	
12V	1500W	230V	50Hz	400L x 320W x 100H	8.0kg	SI121500	
12V	2000W	230V	50Hz	400L x 320W x 100H	8.5kg	SI122000	
12V	3000W	230V	50Hz		kg	SI123000	

1500/2000/3000 watt
inc remote control

with 30 amp automatic
crossover switch and

SI121500U
SI122000U
SI123000U



with 30 amp automatic
crossover switch and

SI241500U
SI122000U
SI123000U

700-1000 watt

24V	150W	230V	50Hz	210L x 120W x 75H	1.4 kg	SI24150	
24V	350W	230V	50Hz	210L x 120W x 75H	1.6 kg	SI24350	
24V	600W	230V	50Hz	310L x 170W x 80H	3.0 kg	SI24700	
24V	1000W	230V	50Hz	350L x 170W x 80H	3.2 kg	SI241000	
24V	1500W	230V	50Hz	400L x 320W x 100H	8.0kg	SI241500	
24V	2000W	230V	50Hz	400L x 320W x 100H	8.5kg	SI242000	
24V	3000W	230V	50Hz		kg	SI243000	

ONBOARD ENTERTAINMENT EQUIPMENT INVERTER

400 watt, Pure sine wave (low frequency)
With auto cross over switch (U.P.S. FUNCTION)

Dedicated for use with AV systems these models have particularly low levels of noise emissions to which very sensitive equipment can be susceptible. The auto crossover function means that when power is transferred from inverter to another available source, there is no loss of power to the appliances. As a result there is no interruption to operation and clock settings etc are preserved.

Output continuous power 400 watts
Surge rating (5 seconds) 800 watt
Output voltage 230 volts +/- 3 volts
Efficiency 88%
Power draw in stand buy 0 amps



includes
d/c input cables
a/c input cables
plus
remote and 10 meters
cable



230 volt Pure Sine Wave Inverters Europe

DC Volts	Watts	Mains	Hertz	Size	Weight	Code	Price inc vat
12V	400w	230V	50Hz	350 x 100 x 85	5.5 kg	SI12400	
24V	400w	230V	50Hz	350 x 100 x 85	5.5 kg	SI24400	

Automatic power selector switch

3 input 32 amp 110/230 v a/c auto selector with remote control

Make your own combi
tailored to your needs

Generator

(UP TO 8000 WATT CONTINUOUS
32 AMP 230 VOLT A/C , FUSED ,OR OTHER SOURCE)

Inverter

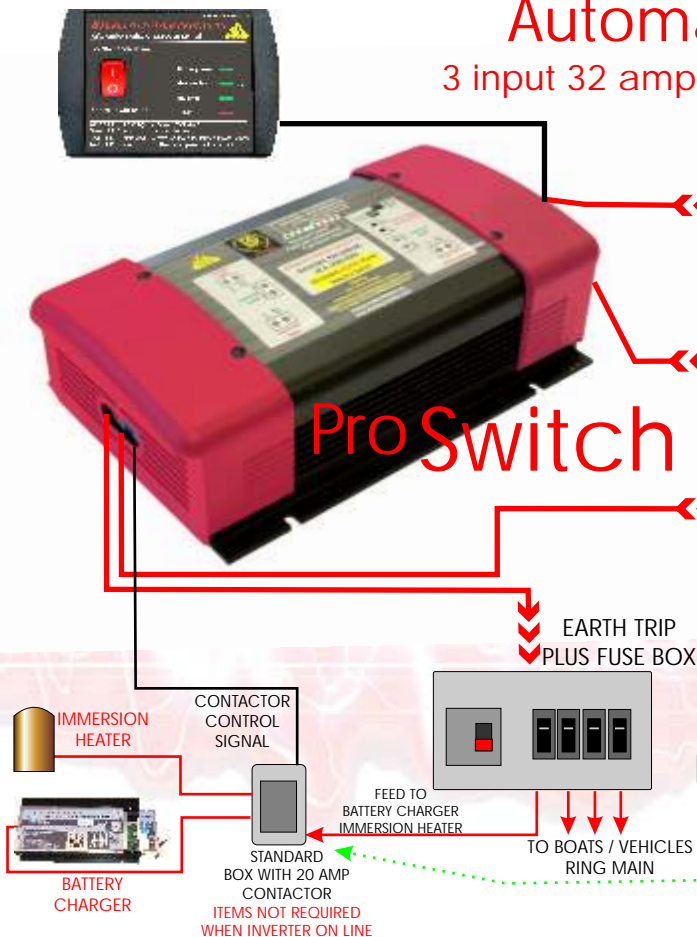
(UP TO 8000 WATT CONTINUOUS
32 AMP 230 VOLT A/C ,FUSED, OR OTHER SOURCE)

Shore Supply

(UP TO 8000 WATT CONTINUOUS
32 AMP 230 VOLT A/C , FUSED, OR OTHER SOURCE)

new

Pro Switch



Boat/vehicle electrics

Pro switch system		
description	Code	Price inc vat
230/110 v 32 amp auto crossover switch	AC32A	
230 v 20 amp contactor relay (optional)	CON1	

The new simple power selector offers many new features not available on the older 16amp crossover switch, due to its digital control system.

- 1) **40 amp internal contractors** : Switches live and neutral with a 0.25 sec time delay between switch off and on, to prevent wave doubling of the voltage and destroying sensitive equipment.
- 2) **Multiple internal power sources** : The system powers itself from each attached power supply; and not from the boats/vehicles d/c system. This is to ensure the system will work even if your batteries are flat. There is no point having an a/c selector switch powered from the d/c system, because if the d/c system fails then you cannot switch the system on to charge the batteries. The Sterling system obtains its control power from each input source, so preventing this problem.
- 3) **Sequential switching** : The unit has a simple operation mode; channel 1 is the priority, then channel 2, then 3. In other words if you allocate the inverter to channel 3 then plug in the shore power on channel 1, the switch will automatically switch the system to the shore power etc.
- 4) **Lock out circuit** : It is assumed that channel 3 would be your inverter (it could be another power supply depending on how you wire the system up). With a lower power inverter you may not wish your immersion heater or battery charger to work when the inverter is on line; so connected to this circuit is a small relay which can break the control circuit on an external contactor /relay block. This then allows you to wire the battery

charger and immersion heater to a separate contactor block, preventing these items being on line when the inverter is operational.

5) **Remote control** : The remote control will tell you which circuit is the current power circuit; and if the light is flashing, then it will also show if power is available on another circuit. There is also a fault light.

6) **Faults / Reverse polarity check**: The unit will show if there is a reverse polarity on channel 'A' which is assumed to be the shore supply system.

7) **Internal fuses** : The control box has 6 internal fuses; one on each live and neutral, so that even in the event of a reverse polarity the neutral line is also fused for safety reasons.

8) **Remote on/off**. This switch enables the shore power to be switched off (the priority circuit) in the event of the shore power not being powerful enough to do a specific job, for example if your shore power was limited to say 5 amps (about 1.2 kw) but your immersion heater/washing machine may be 3000 watt, you may wish to shut down the shore supply and allow the more powerful inverter or an onboard generator to do the job.

9) **230 v or 110 volt** or a mixture of each can be used at the same time, ensuring operation in all the worlds different power supply conditions.

10) **other features** include a 10 sec time delay on the generator line to allow generator start up

230 v manual 16-30-50 amp 3 way cross over switch

ideal where multiple power sources are used such as
inverters, shore power and generators on a boat/vehicle

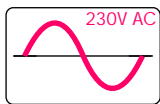
Easy to install
Front panel waterproof
Easy to use
Supplied with 2 shafts
for thin panel mounting
and ½" panel mounting



Part number	SCS20A	SCS32A	SCS50A
OUTPUTS	1	1	1
INPUT SOURCES	3	3	3
CONTINUOUS AMPS	20	32	50
MAX VOLTAGE	300	300	300
NUMBER OF POLES	3	3	3
Price inc vat			

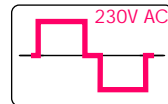
ProCombi S

Pure Sine Wave



ProCombi Q

Quasi Sine Wave



1600, 2500 & 3500 Watt

Standard Features:

- 30 amp through current
- P.F.C. (power factor correction)
- Inc Remote control with 10 meter cable
- 4 step progressive charging
- 8 battery type selector

The new Pro Combi range are designed to be very competitive, no frills, high performance, and value for money products, presented in a simple, easy to install and use style.

If you require power assist, parallel connection, three phase output functions or any other enhanced combi features then this range is not for you . If you're not familiar with these things this ProCombi is perfect for you.

Modern combis are getting more and more complex, with each company trying to out do the next with abilities beyond the understanding and requirements of most people. This detracts from the combi's main strength of being easy to install and easy to use. There is, no doubt, there is a market for all the sexy functions but the vast majority of combi users simply do not need them and never will. Most people simply require the unit to act as a high performance constant current battery charger when on mains power then cross over to act as an efficient inverter when on battery - and that's it!

The problem with enhanced functions is, even if they are not used, they eat up valuable power. The more functions on a product running (even thought you do not use them) the higher the quiescent current on the inverter (the current the unit uses itself to operate). Complex combis at 12V can use as much as 9.5 amps whereas Pro Combi can use as little as 2 amps.

Sterling have reversed this trend with this Pro Combi range by stripping away the unnecessary features from a complex combi, not only saving money but also lowering the critical quiescent current draw. The end result is a simple, straight forward product that does what you think it should. Using our years of experience in this market we have tailored the product range to suit 90% of people purchasing Combis.

We have also added what we see as important features to this range that even the expensive combis do not have such as the ability to charge totally flat batteries and allow through power with no batteries connected.

How to compare model ratings with other Combis: Watts vers/ VA the truth

The most significant issue to be aware of is how output ratings are massaged to appear better than the competition. You might be excused for thinking that a unit with '3000' written on it, for example, means that it will deliver 3000 watts continuously. This is not necessarily the case , when you look at the small print.

Have you never found it strange that the product you want to run (ie the hair dryer, washing machine, TV, etc) in there specification have the power consumption in watts, yet the inverter/ generator companies give you there rating in VA, and when you put your 1000 watt product on a 1000 va inverter it does not work because in the small print you find out that the 1000 va inverter is only 700 watts for 10 mins then it over heats, this simply cannot be right.

In the eyes of the unknowing consumer, rating a power product in VA is a simple way of using meaningless figures to confuse and make performance appear better that it really is. Unfortunately this practice is still allowed in Europe (European standards committees are looking into this practice) unlike the USA where there are recognised standards (eg ABYC) and you can be sued for publishing misleading information and incorrect ratings. The only true rating, without confusion, is in watts, using a simple resistive load with unity power factor, such as a electric heater / standard light bulb, etc. This method gives a lower correct figure, however it is not what the marketing teams involved in promoting power products want to see.

Take, for example a 3000 Victron Multi that is perceived by the public to be 3000 watts continuously rated. If, however, you read the Victron specification for watts at 40degC the actual power is 2000Watts. The Sterling 2500W Combi delivers 2500Watts which in fact makes it a more power full unit . This distortion is not limited to Victron, unfortunately most, if not all, the European manufacturers push model figures to the realms of fantasy in spiralling competitiveness and in order to confuse and impress the public who believe that these figures are actual continuous power rating.

Combined inverter charger



Winner
Selling Today Best Buy
in Combi Test against
Victron, Mastervolt &
Studer

To ensure you are getting value for money you have to ensure you compare the true continuous power in watts at 40degC. Companies like Mastervolt do not even publish this figure , I can only assume, is through embarrassment.(not available on there specification sheet on 12 Aug 2008)

Furthermore, the effects of temperature and the duration of duty (i.e. how long a load is maintained) can also be used to manipulate ratings. It is much harder for a unit working in 40degC ambient temperature than in 25degC, just as it is harder to run at a higher load for extended periods. So a unit rated for short periods at a cooler temperature will also appear more powerful.

To illustrate, taking data published by Victron Energy and Mastervolt, the following comparison can be made:

Model/product	Public perceived power	True Cont. Watts @ 40degC
Victron Phoenix MultiPlus 12/3000/120	3000W	2000Watts
Mastervolt Mass Combi 12/2500-100	2500W	Not stated
Sterling Pro CombiS or Q 12/2500	2500W	2300Watts
Victron Quatro 12/5000/120	5000W	12 v 3000Watts
Sterling 3500 combi	3500W	3300Watts

The simple truth of the matter is VA means nothing, if you want to know how much power your inverter is going to give you then ask for the rating in watts at 40 deg c , all the other ratings should be kept for the comic books where they belong. ProCombi has the lower value in the model name but, in fact, is the more powerful of the bunch when like for like ratings are compared making it even better value for money than you thought!. With a Sterling unit you get what you think you should be getting, and it does what it says it does on the box.

The sooner ratings have a legal recognise standard like the U.S.A. then the better for everyone.

Wave Form	Input voltage	Inverter power	Part number	Retail inc vat
ProCombi Q				
Quasi Sine	12 v	1600 watt	PCQ121600	
Quasi Sine	12 v	2500 watt	PCQ122500	
Quasi Sine	12 v	4000 watt	PCQ123500	
Quasi Sine	24 v	1600 watt	PCQ241600	
Quasi Sine	24 v	2500 watt	PCQ242500	
Quasi Sine	24 v	4000 watt	PCQ243500	
ProCombi S				
Pure Sine Wave	12 v	1500 watt	PCS121500	
Pure Sine Wave	12 v	2500 watt	PCS122500	
Pure Sine Wave	12v	3500 watt	PCS123500	
Pure Sine Wave	24 v	1500 watt	PCS241500	
Pure Sine Wave	24 v	2500 watt	PCS242500	
Pure Sine Wave	24v	3500 watt	PCS243500	
accessories				
1.2 m 300A cable for 12 v 2500			C300	
1.2 m 180A cable for 12 v 1500 & 24v 2500			C150	

What does the Pro Combi range offer?

On the battery charger side

- 1) 4 step constant current battery charging
- 2) 8 pre set battery type selector plus de-sulphation
- 3) powerful charge rate
- 4) will charge totally flat batteries
- 5) PFC, draws about 30% less power than conventional units

On the crossover side

- 1) 20 m/s crossover time, will not to lose any equipment due to power loss
- 2) 30 amp through current ability on all models
- 3) twin 30 amp / single 50 amp on the 3500 watt models

On the inverter side

- 1) high overload ability
- 2) high temperature rating
- 3) low quiescent current
- 5) power saver mode to automatically reduce power
- 6) allows through power even with no batteries connected

On the remote control

- 1) ability to switch the unit on/off
- 2) ability to select or de select power saver mode

General specification

Input Wave form:	Sinusoidal
Nominal Voltage:	Input 230 v a/c
Low voltage trip:	184v+/- 4%
Minimum engage:	voltage 194v +/- 4%
High voltage trip:	253v +/- 4%
High voltage re engage:	243v +/- 4%
Max input a/c voltage:	270 v rms
Nominal input frequency:	50hz or 60hz auto detect
Low freq trip:	47 hz for 50 hz, 58 hz for 60 hz
High freq trip:	53 hz for 50 hz, 62 hz for 60 hz
Output wave form:	(on by pass mode) same as input
Overload protection :	Circuit breaker
Short circuit protection :	Circuit breaker
Transfer switch rating :	30 amp
Efficiency on line transfer mode:	96%+
Line transfer time :	20 ms
Bypass without battery connected :	yes
Max by pass current :	30 amps
By pass over load current :	35 amps: Alarm
Inverter Specification / output	
Output wave form:	Modified Sine Wave/ Quasi sine wave
Output continuous power watts	1600 2500
Output continuous power VA	2400 3600
Power factor:	0.9- 1.0
Nominal output voltage rms :	230vac
Max voltage rms :	260vac
Output voltage regulation:	+/- 10% rms
Output frequency:	50hz+/-0.3hz or 60hz+/-0.3hz
Transient response time:	<150ms;0% to 100% RCD load
Nominal efficiency :	>85%
Surge ratings :	1500model =4500va 2500model = 7200va
Online current consumption at 12 v/24	12v1.8a 24v 0.9a
Power saver mode current consumption	12v0.4a 24v 0.2a
Short circuit protection:	yes, less than 3 cycles
Inverter Specification / input	
Nominal input voltage :	12 or 24 v depending on model
Minimum start voltage :	10 v for 12 v model 20v for 24 v
Low battery alarm:	10.5v for 12 v model 21v for 24 v
Low battery trip:	10 v for 12 v model 20v for 24 v
High voltage alarm:	15.5 for 12v model 30v for 24 v
Power saver :	below 20 watts when enabled
Power saver :	can be switched on/off on remote control
Charger Mode specification	
Input voltage range:	196-245 v ac
Output voltage:	dependent on battery type selection
Output current 12 v model :	1600- 40A 2500 - 50A
Output current 24 v model :	1600- 20A 2500 - 25A
Battery initial voltage for start up:	0-15v for 12 v x 2 /24v
Over charge protection shutdown:	15.7 12 v x 2 for 24 v

Charger curves (4 stage constant current)Battery types 4 step digital controlled progressive charge

Battery type	charge v	float v	x 2 for 24 v
Gel U.S.A	14.0	13.7	
A.G.M. 1	14.1	13.4	
A.G.M. 2	14.6	13.7	
Sealed Lead Acid	14.4	13.6	
Gel Euro	14.4	13.8	
Open Lead acid	14.8	13.3	
Calcium	15.1	13.6	
De-sulphation	15.5 for 4 hrs		

Battery bank size: auto detected / auto program adjusted

General Features.

Remote control. Front control panel removable as remote

Size: in mm 185W 180H 430L (1600, 2500)

Weight: 1600w 18 kg 2500w 20 kg

General

- 1) removable local panel to give remote control with warning and function I.e.d.
- 2) remote on/off plus remote power saver on/off
- 4) 10 metres remote cable
- 5) almost 20 alarms/ warnings/and information

There are 2 main models the **Pro Combi Q** (for **quasi-sinewave**) and the **Pro Combi S** (for **Pure-sinewave**)

So the simple question is what best suits your needs?.

Pro Combi Q, (quasi-sine model) suitable for most installations, where you would use a microwave, fridge, hair dryer, vacuum cleaner, kettle, computer, etc The vast majority of products will run on quasi-sinewave.

Pro Combi S (sine wave model) where all the above plus washing machines, bread makers , thyristor controlled equipment are used - then sinewave is required

To Make the choice even simpler, we have a 6 months exchange/upgrade policy . If you purchase a Pro Combi Q and find there is some equipment that you cannot run due to the Quasi Sinewave and require Pure Sinewave, Sterling are happy to up-grade your quasi-sine unit for sinewave with the only cost being the difference between the 2 products (unit must be sent direct to Sterling and in good condition).

Pro Combi S

Pure sine wave
Input 230 v a/c
184v+/- 4%
voltage 194v +/- 4%
253v +/- 4%
243v +/- 4%
270 v rms
50hz or 60hz auto detect
47 hz for 50 hz, 58 hz for 60 hz
53 hz for 50 hz, 62 hz for 60 hz
(on by pass mode) same as input
Circuit breaker
Circuit breaker
1500-2500 w = 30 amp the 3500 w= 50 amp
95%+
20 ms
yes
30 amp
35 amps: Alarm

Inverter Specification / output

Pure sine wave
continuous 2100 (2500 30 min), 3200 (3500 30 mins)
3100 5000
0.9-1.0
230vac
260vac
+/- 10% rms
50hz+/-0.3hz or 60hz+/-0.3hz
<150ms;0% to 100% RCD load
>88%
PQS1500=4500va PQS2500=7200va
not available until march 2008
not available until march 2008
yes, less than 3 cycles

Inverter Specification / input

12 or 24 v depending on model
10 v for 12 v model 20v for 24 v
10.5v for 12 v model 21v for 24 v
10 v for 12 v model 20v for 24 v
15.5 for 12v model 30v for 24 v
below 20 watts when enabled
Same switched on/off on remote

Charger Mode specification

196-245 v ac
dependent on battery type
1500 - 40A 2500 - 70A 3500 - 100A
1500 - 20A 2500 - 35A 3500 - 50A
0-15v for 12 v x 2 /24v
15.7 12 v x 2 for 24 v

Charger curves

Same as Pro Combi Q

same

same

same

same

same

same

same

same

same

same

General Features.

Front control panel removable as remote

Size: 185W 180H 430L (1600, 2500) 227W 180H 512L (3500)

Weight: 1500w 20 kg 2500w 20 kg 3500 24kg

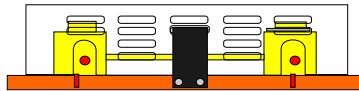
Power Management Panel able to read 4 X AMPS , 4 X VOLTS AND 1 X Amp Hr Counter Shunt Type (POS OR NEG SHUNTS)

The latest software driven Power Management Panel is an extremely effective unit designed to monitor and display all the vital electrical information on an average boat. This enables important (potentially expensive) decisions to be made regarding faults and general on-board D/C electrical power management. The information obtained also helps any third party engineer to identify problems. The operation of the panel is based on 100 mV shunts. Shunts enable all current measurement to take place remotely from the instrument clusters, thus removing all the voltage drop and R.F.I. problems associated with running heavy duty cables up to a control panel and navigation instruments.

The new panel has a built in amp hour counter on one channel, and in total

Power Consumption = 0.5 ma off/0.7 ma on
Max readable current = 199 a D/C
Max display volts = 199 volt D/C
Safe to over 1000 amp surges
L.E.D. Background light.
amp hr ctr up to 7999 amps
Screen = 16 digit 2 line L.C.D.
Back light/switched
Accuracy = + or - 1%

Extra Shunts
available, 200 amp,



200 amp shunt = 200Lx40Wx50H

400 amp shunt = 260Lx55Wx50H

Power Management Panel with Amp Hour Counter
(Includes 1x 200 amp brass shunt)

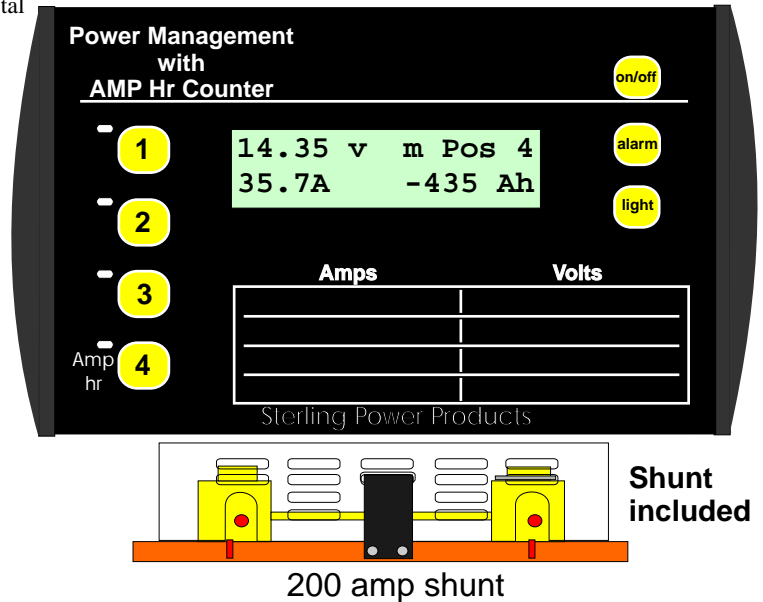
Power Management Panel			
Size	Weight	Code	Price inc vat
170 x 90 x 40mm	0.5kg	PMP1	
Extra Shunt 200 amp		S200A	
Extra Shunt 400 amp		S400A	

A 200 amp shunt is suitable for Inverter s up to about 2000 watts at 12 v / 4000 at 24 v
the 400 amp shunt is suitable for inverter s up to about 4000 watts at 12 volts. The shunts have a very high instant load ability, ie 1000 amps to start an engine etc is no problem on either size

enables 4 different amp readings, 4 different volt readings, and one amp hr counter. **The shunts of the system can be fitted in negative or positive cables (unlike most others).** The counter counts the amps going into and out of the battery system. The amp hour counter set up and function are completely automatic and requires no intervention from the user. The background light ensures perfect legibility in daylight, direct sunlight and at night.

Each panel comes complete with a 200 amp shunt, (up to 3 extra shunts may be purchased) and a list of labels for the panel front.

The plastic box can either be surface or flush mounted by using the new parts.



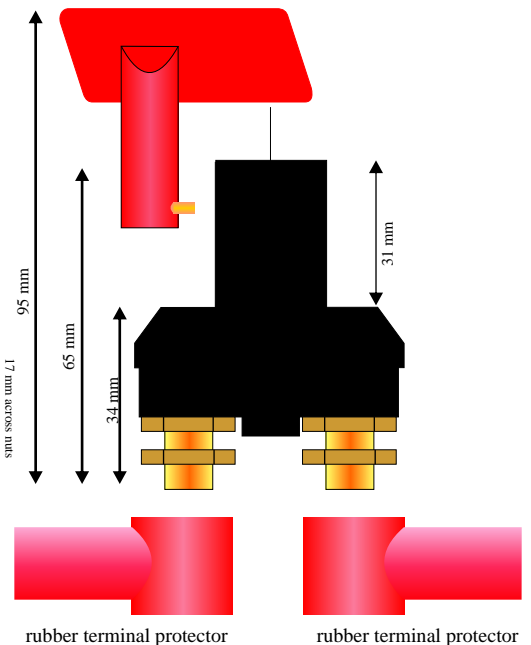
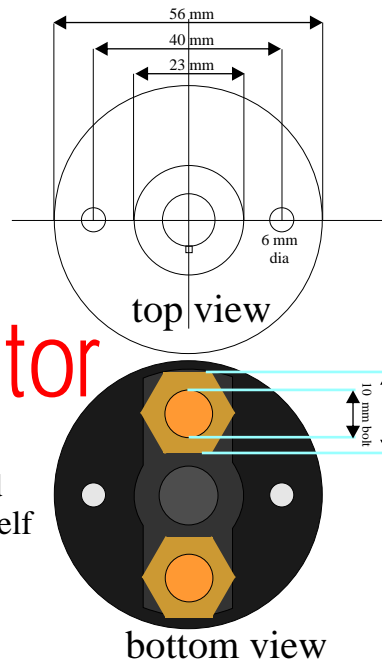
200 amp continuous
1000 amp overload
water proof cover
rubber boots for main cables
2 keys



D/C Pro Isolator			
Continous current	Weight	Code	Price inc vat
200 amps at 12 v 100 at 24 v	0.1kg	IS200	

Pro
Isolator

pre-boxed
ready for shelf



Electrical Specification: Meets IEC 1010 CAT111

D/C voltage 0-200 volts overload protection 600V

A/C voltage 0-500 volts overload protection 600V

D/C current 0-600 amps overload protection

A/C current 0- 600 amps overload protection

Resistance 0-200 ohms overload protection 400V

Continuity beeper

Data hold function

A/C frequency response from 40-400 Hz

A/C speck tested on sine wave 50/60 Hz

Compact yet heavy duty

D/C Clamp
metre



D/C Voltage Probe & Diagnostics Tool

At first glance this low cost D/C voltmeter looks like any other one available anywhere, however, on closer inspection you will see it is not. Standard voltage probes only go to 14 volts and is unable to inform you if the advanced charging cycle is in progress or a system has failed and is overcharging your system. The extra 2 LED's are preset to give more useful information than the very limited standard ones. This is a Sterling product and is not available anywhere else. Available in 12 and 24 volt versions.



D/C Voltage Probe & Diagnostics Tool				
DC Volts	Size	Weight	Code	Price inc vat
12V	100 x 20 x 15mm	0.25kg	TM12V	
24V	100 x 20 x 15mm	0.25kg	TM24V	

No Batteries, Wind up Multimeter



Do you ever find yourself needing a multimeter , which you know you have somewhere and when you find it the batteries are flat, well never again, this new product has no batteries so you can leave it as long as you like, simple wind the handle 2 times for about 2 mins use, winding for about 10 seconds will give about 10 minutes of use .
The high quality extremely well equipped with all the features and functions required for general use

- GENERAL SPECIFICATIONS**
- Display 46 mm x 23 mm large LCD display.
 - Measurement AC, ACA, DCV, DCA, ohms, continuity beeper, Hz, %, Capacitance, Diode, Data hold.
 - Range selection Auto ranging with manual selecting.
 - Data hold to freeze the display reading
 - Dimensions 152 x 78 x 45 mm
 - Weight 350 g
 - Includes Red and Black test leads plus instruction manual
 - Electrical Specification**
 - D/C voltage
 - Range Volts 400.0 mv - 1000 v D/C
 - Accuracy +/- (1% + 3d)
 - Input impedance 10 M ohm
 - D/C & A/C current
 - 10 A - 400 uA
 - Overload Protection Fuse
 - Ohms
 - 400-40 M ohm
 - Capacitance
 - 40nF-100 uF
 - Frequency
 - 4 Hz - 4 MHz
 - Diode
 - (forward voltage , VF)
 - Range 4 V DC
 - Resolution 0.001 V
 - Test voltage 1.6 v DC
 - test current 1 +/- 0.6 amps
 - Continuity Beeper
 - Beep if measured resistance less than 100 ohm
 - response time < 100 ms

Code	Description	Price inc vat
WUVM	Wind up volt meter	

High amperage alternators
with or without advanced alternator regulator

12 v 145 amp
GOOD LOW R.P.M. PERFORMANCE

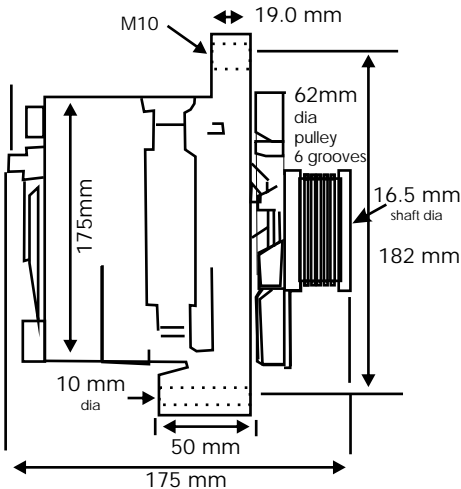
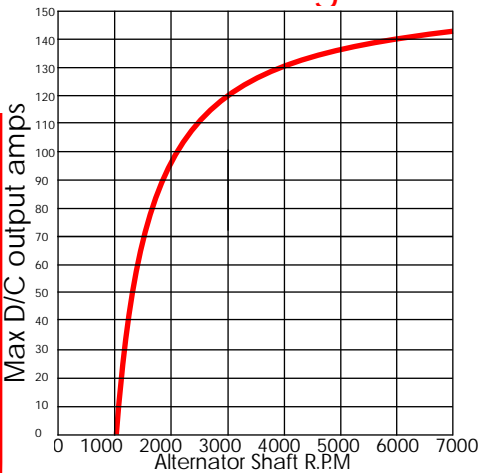


CS144 Delco

with or without the best advanced alternator reg on the market fan

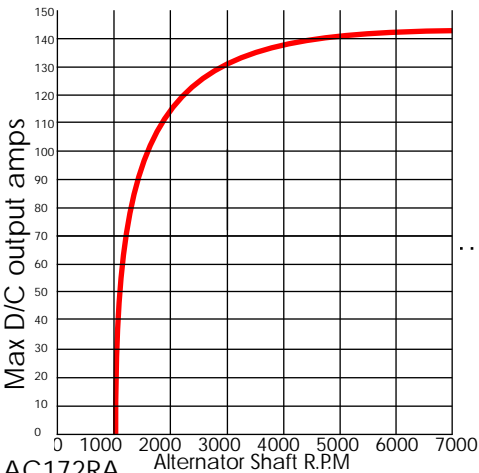
STERLING POWER PRODUCTS

PDAR
DIGITAL 4 STAGE
ADVANCED
ALTERNATOR
REGULATOR



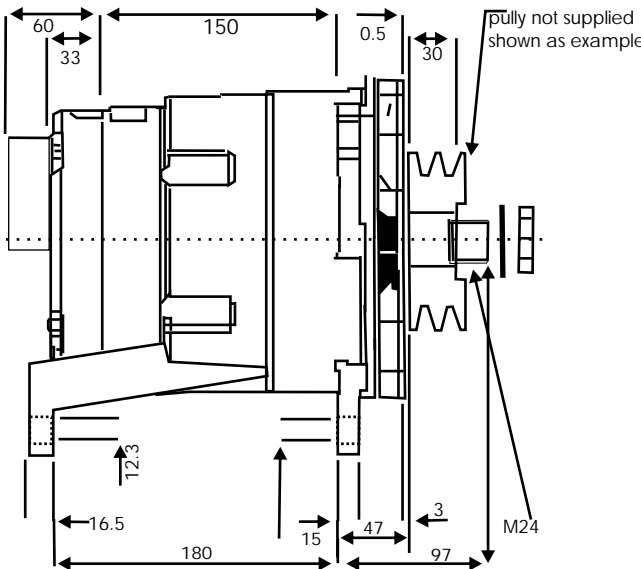
Code	Description	Price inc vat
AL12140	12 v 140 AMP ALT WITH STANDARD REG	
AL12140PDAR	12 v 140 AMP ALT WITH DIGITAL ADVANCED REG	

24 v 140 amp
GOOD LOW R.P.M. PERFORMANCE



AC172RA
Bosch 0120 689 520
Prestolite 1277640
Equivalent product part numbers

Code	Description	Price inc vat
AL24150	24 v 150 AMP ALT WITH STANDARD REG	
AL24150PDAR	24 v 150 AMP ALT WITH DIGITAL ADVANCED REG	



BATTERY TERMINALS



GBT-600PN	GBT-100PN	GBT-700PN	GBT-2488
STANDARD CLAMP PLUS BOLT	STANDARD CLAMP PLUS WING NUT	STD CLAMP PLUS 10mm CABLE CLAMP	
80g	110g	95g	
Price inc vat			

SOLID BLOCK POWER DISTRIBUTION



GPB-102468	GPB-1044	GPB-2488
CABLE DIAMETERS 1 X 12 mm 4 X 10 mm 4 X 6 mm 2 X 10 mm 6 X 8 mm	CABLE DIAMETERS 1 X 12 mm 4 X 10 mm 2 X 6 mm 1 X 10 mm 2 X 6 mm	
407g	431g	232g
Price inc vat		

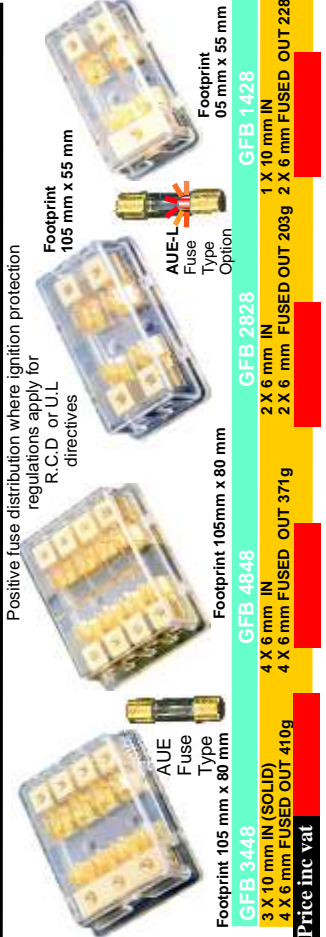
FUSE BLOCK SERIES FUSE TYPE AMT RANGE 20-80A 0-32 V MAX



FUSE BLOCK SERIES FUSE TYPE ATQ RANGE 3-35A 0-32 V MAX



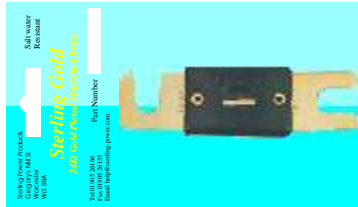
FUSE BLOCK SERIES FUSE TYPE AUE 1-80A 0-32 V/125V/250V



24Kt Gold Plated

All products are precision machined from solid brass with a 24kt gold finish. Do not confuse with lower cost zinc-lead alloy die-casting.

All pre-packed



SINGLE FUSE BLOCK SERIES FUSE TYPE ANL 60-500A 0-32 VOLT



GANL 1	GANLW 1
1 X 12 mm IN 1 X 12 mm FUSED OUTPUT	1 X 12 mm IN 1 X 12 mm FUSED OUTPUT
290 g	340 g
Price inc vat	

SINGLE IN LINE FUSE HOLDERS FOR AUE FUSE

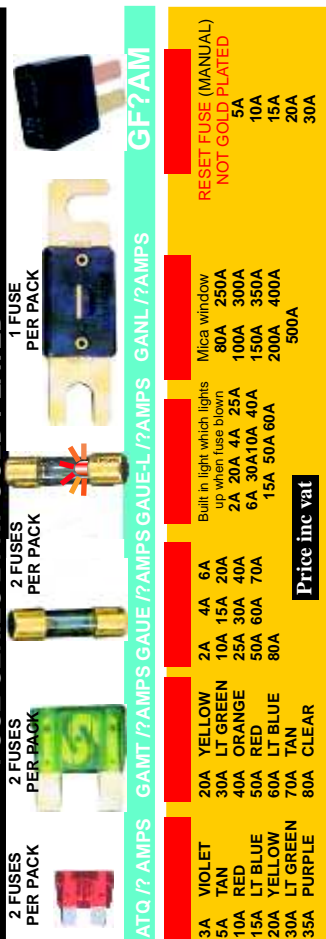


GFH-04-1	GFH-168	GFH-80
Single AUE fuse holder 10mm cable with eye Bolt for battery terminal 50g	Single AUE fuse holder 10 mm cable in and fused out 50g for ring terminal suitable for 10 amp fuse	Single AUE fuse holder suitable for ring terminal comes with 10 amp fuse
Price inc vat		

NEW RING CONNECTOR TYPE



FUSE SERIES 24 KT GOLD PLATED



Stainless steel
or copper
flange
4 mm

Stainless
steel tube
or
copper

Weld
or solder

Internal dia
6 or 7 mm

External
diameter
5.5-6 mm

Oil resistant
tube

Oil resistant
gasket about 3 mm

Supply
m 3 nut and bolt for metal tanks
or 4 mm self taper stainless steel for plastic

4.2 mm hole

**Tank
top**

**0.95 meter
can be
extended to
2 meters**

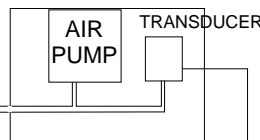
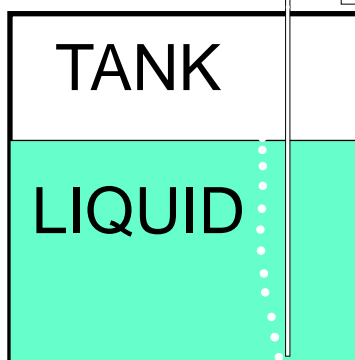
Pneumatic Tank Gauge

**Pump /control box must be positioned
above the highest point of the tank, ie
above the filler cap height, in order to
prevent liquids from entering the unit
and damaging the sensors**

Tank Gauge System Pump Package and L.E.D Display

Size	Weight	Code	Price inc vat
145mm x 90mm x 40mm	0.5kg	TGS	

**MAX TANK DEPTH
ON STANDARD MODEL
SET ON WATER DENSITY
1.50 metre**



Red flash	100-95%	1
Red on	90-95%	2
PUMP ON/OFF	80-90%	3
Green on	70-80%	4
PUMP ON	60-70%	5
CONTINUOUS	50-60%	6
MODE	40-50%	7
Green on	30-40%	8
ALARM OFF	20-25%	9
Green on	15-20%	10
LOW VOLTS	10-15%	11
WARNING	0-10%	12

pump package includes

- 1) air pump and transducer box
- 2) l.e.d. output display
- 3) 1 meter plastic pipe from pump to tank
- 4) 5 meter cable from pump to l.e.d. display
- 5) full instruction set

1 Meter stainless Tube tank gauge

Weight	Code	Price inc vat
0.05kg	SST	£35.25

The problem?

Most boats suffer badly from unreliable tank level gauges, this is a particular problem with dirty water tanks. The main problem is the corrosive nature of the salt water in the tank and the fact that float meters are damaged in the tanks.

The solution:

The measuring device must not be effected by the movement or the corrosive nature of the fluid it is measuring. The best way to achieve this is the way ships and other quality tank meters work. And this is to use pneumatics. This has always proved too expensive to miniaturize for leisure craft use until now.

How does it work?

The new Sterling gauge works on a very simple principle. If you put a small tube to the bottom of any liquid, then pump air through the tube to remove all the fluid from it, then the atmospheric pressure or back pressure on the liquid is directly proportional to the depth of the fluid (taking density into account). For this to work, we need a simple pipe (approx 2-3 mm diameter) from the top to the bottom of the tank, then pump air through the pipe and measure the back pressure of the air (the transducer) and display it on a display panel. Simple?

Well not that simple, we need a compressed air pump with a complex software program control to reduce power consumption to milliamps, and to return a highly accurate reading, all at a sensible cost.

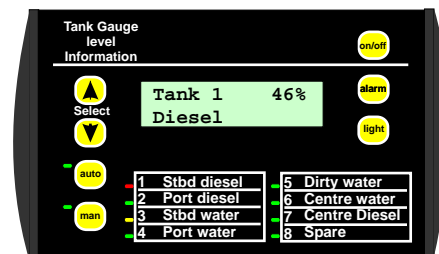
The Sterling Tank Gauge is a fully programmable

system, where you program in the following information, 1) tank depth 2) fluid density (water, diesel, dirty water, petrol) 3) operation mode (i.e. a water or fuel tank would require the alarms etc to go off when the tank is empty, but a dirty water tank would require its alarms when it is full.) with these three pieces of information simply connect the unit to a pipe which is about 10 mm of the bottom of the tank, and the L.E.D. display will give a good indication of the depth. For a more accurate analysis the L.E.D display can be connected to the **optional** L.C.D display which will scan up to 8 tanks and display the depth in % full in rotation, when the fill button is pushed on the tank, for example tank 6, then the L.C.D. display will lock on to that channel.

The system must only be used where the pump sensor unit can be fitted above the level of the highest point on the tank system, ie above the height of the deck filler system, or a U bend in the tube going above the filler, ie in a over fill condition liquid must not run into the unit

Quick check list

No moving parts in the tank
No electricity in the tanks
Cannot stick corrode or jam up
Not effected by any corrosive fluid
Easy to replace or repair if faulty
No need to test (set up in software program)
Very accurate
Alarms adjustable both ways
Set for water, diesel, petrol, sea water
Voltage 8-32 volts
Self cleaning
Local and remote readings



Multi tank gauge kit includes

- 1) 8 tank l.c.d. reader / scanner panel
 - 2) selection of sticky labels with tank names
 - 3) 2 x 10 meter cables for 2 tanks
- extra tank cables can be purchased

8 Tank L.C.D. Display Scanner Unit

Size	Weight	Code	Price inc vat
90mm x 60mm x 8mm	0.2kg	TGM	
Extra 5 & 10 metre cable for scanner unit			
Size	Weight	Code	Price inc vat
10 meter	0.1kg	TGL10M	
5 meter	0.25kg	TGL5M	

Galvanic Isolators / Zinc Savers

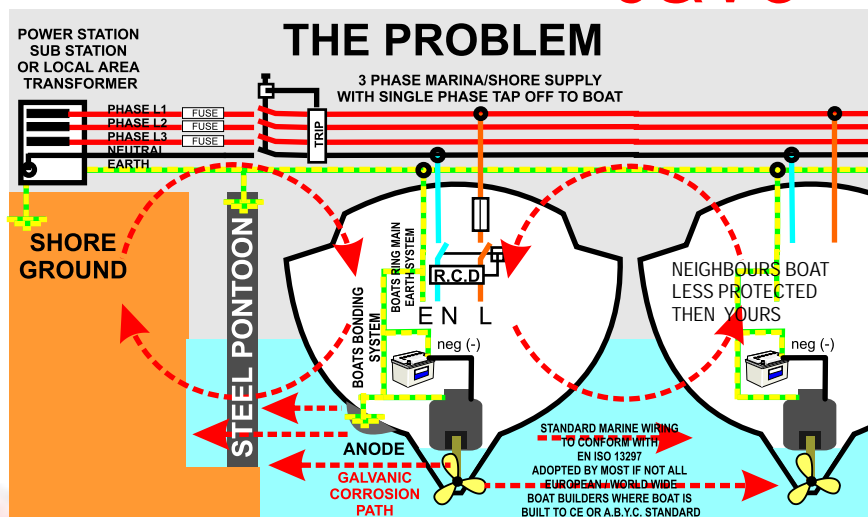
ProSave

THE PROBLEM:

Recent interest in damage done to boats due to the 230V shore mains has highlighted the need to fit a galvanic isolator to your boat. In order for modern boat builders to comply with modern CE standards such as EN ISO 13297 they must fit the shore earth wire to your boats bonding system which is also connected to the hull / anodes / fuel tanks / engine blocks / shafts / propellers / stern tubes / rudders / rudder glands / water intakes / etc. This ensures that any 230V mains faults will operate the R.C.B on the boat in order to save your life. The down side from these standards is that electrically speaking your boat is now connected to the rest of the boats in the marina and any other metal structures in the area. Electrically speaking they become one and the same. If you follow the earth line you can see everything bonded to the earth, this includes your boat, the one next to you, metal work etc. This results in two main problems.

1) Any earth problem on any boat or

shore earth will increase the voltage in the common earth cable and so dissolve adversely effect your boat by dissolving your anodes at an alarming rate (this could result in the total loss of all the metal on the boat below the waterline)
2) Because all the boats are now one, if you have a zinc anode on your boat, but the boat beside you does not, or even worse the marina has not put anodes on its structures (metal pontoons etc) then your boat's zinc (or aluminium / magnesium) will protect all the structures and boats around you, resulting in dramatic zinc loss and expensive lift-outs to replace the zinc. For boats on inland waterways, if you have a magnesium anode and every one else has zinc or no anodes at all, your magnesium anode will protect all.



THE SOLUTION:

The trick is to maintain the continuity with the earth to ensure the safety of your life but remove the continuity with the shore power for the safety of your boat. The solution is very simple. By installing a Galvanic Isolator / Zinc Saver we maintain a good earth link with the shore, but prevent any stray currents coming up the earth line and damaging the boat. The isolator is in theory a simple device but it has to be built to a stringent specification and tested by an independent test house to

ensure they comply with the relevant standards, be it the less stringent CE standard or the more stringent American Boating and Yachting Council standard. This means in a major fault condition it can carry its rated current for 24 hrs without exceeding 90 C on the heat sink. The Galvanic Isolator has the following extra features:

TOTAL PROTECTION:

Recent upgrades in the new A.B.Y.C. have removed the need for a monitoring system

on the zinc saver, as long as, if the unit was to fail (which in the excess of 500,000 of the older version sold with 0% failure rate) then the internal devices must fail in such a way as to continue to ensure the safe connection of the earth circuit. Having spent a lot of money on a new mono silicon block to ensure the unit will perform as per the new specification and many hrs testing by UL labourites, the new Pro Save FS (see next page) is now fully certificated as a fail safe device and as

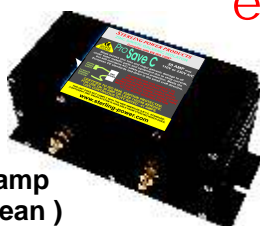
such no longer needs any monitoring system, this ensures a simpler and lower cost installation for this new product

Suitable for use in Europe and the rest of the world except the U.S.A

ProSave A

By far the most common used device in Europe, complies with all the requirements, and is also low cost and very effective

30-50 amp
(European)



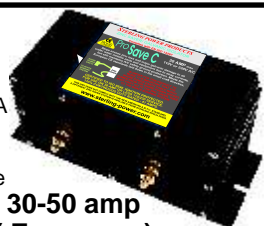
Galvanic Isolators / Zinc Savers Standard version with no cap

Amps	Size	Weight	Code	Price inc vat
30A	220 x 120 x 100mm	1.5kg	ZS30A	
50A	220 x 165 x 100mm	1.8kg	ZS50A	

ProSave C

Looks the same as the Pro Save A except has a internal 25,000 uF 2.5 v capacitor to raise the performance of the unit in extreme a/c leakage conditions

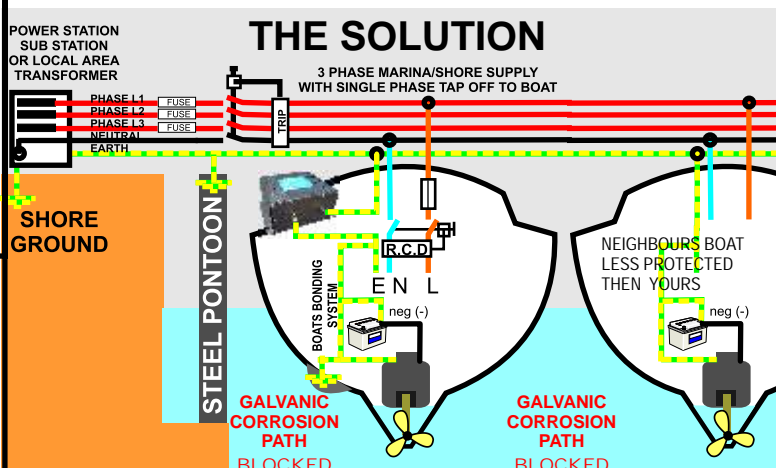
30-50 amp
(European)



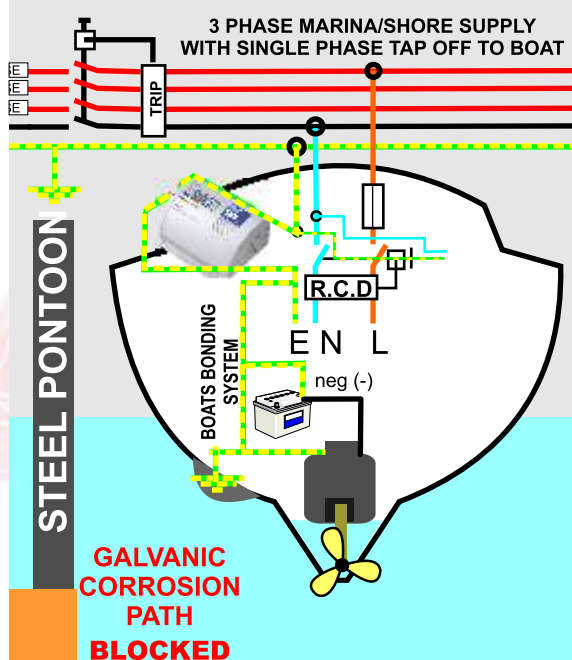
INTERNALLY
INSTALLED
25,000 uF
2.5v

Galvanic Isolators / Zinc Savers Standard version with internal cap

Amps	Size	Weight	Code	Price inc vat
30A	220 x 120 x 100mm	1.5kg	ZS30C	
50A	220 x 165 x 100mm	1.8kg	ZS50C	



New Pro Safe FS 30 & 60 amp **Fail Safe** to the latest **A,B,Y,C** specification tested by **UL** Suitable for use in the U.S.A.



LATEST A B Y C PROTECTION

UL Certified 205007

ProSafe FS installs easily and does not require a dedicated monitor to verify the operational status of the galvanic isolator as required by non FailSafe Certified galvanic isolators.

ProSafe FS 30 & 60 are built on robust FlatPack semiconductor platforms ensuring that in the event of a failure, the failure is safe by not compromising the ground continuity on-board when connected to AC Shore Power.

ABYCA-28 July '08 Compliant and Fail Safe Certified

Certified by Underwriters Laboratories (UL). Insures shore power safety ground wire is maintained through the isolator.

Flat Pack High Power Semiconductors

Robust high power diodes allow the FS Series to meet the new FailSafe criteria for conducting inrush currents of 5,000 amps for the required duration period.

Innovative Design

The FS 60 will cool itself in the event it must conduct current insuring cooler operation in this mode.

Ignition Protected

Meets ISO 8846 and can be mounted within an engine compartment

Gold Plated Terminations

120/240 VAC / 30A max/ 50 or 60 HZ



ProSafe FS30

For 30 Amp Shore Cord Applications

120/240 VAC / 60A max/ 50 or 60 HZ



ProSafe FS60

Patent Pending

For (1) 50 Amp or (2) 30 Amp Shore Cord Applications

specifications:

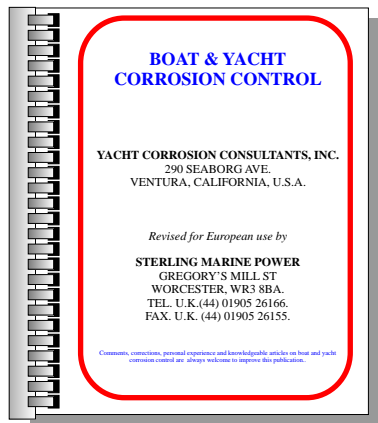
shore cord inlet	-	Single 15,16,20
compatibility		or 30
ratings VAC/Max	-	120/240 VAC/41A
AMPS/Hz		50 or 60 HZ
max unit temp	-	50 deg C
size L x W x H mm	-	175 x 185 x 65
weight kg	-	1.5 kg

Galvanic Isolators / Zinc Savers Standard version with internal cap

30A	175 x 185 x 65 mm	1.5kg	ZSFS30	
60A	190 x 165 x 95mm	1.8kg	ZSFS60	

specifications:

shore cord inlet	-	Single 50 or dual
compatibility		15,16,20 or 30
ratings VAC/Max	-	120/240 VAC/41A
AMPS/Hz		50 or 60 HZ
max unit temp	-	50 deg C
size L x W x H mm	-	190 x 165 x 95
weight kg	-	1.8 kg



Yacht Corrosion Monitoring Equipment

This equipment highlights any electrical and electrolytic problems which will cause expensive corrosion on a boat

Yacht Corrosion Test Meter And Workbook

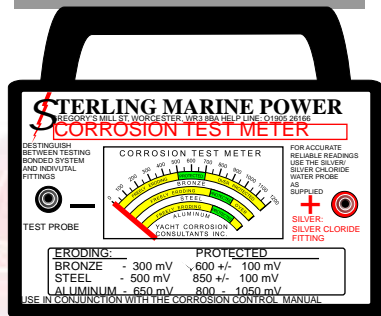
Corrosion Test Kit comprises of an easy to follow instruction manual, which includes survey report documents. The kit also includes the required test meter and silver/silver chloride test leads. The portable meter is the only way to test each individual item on the boat (overboard bronze skin fittings, bronze valves, rudders, prop shafts, etc). Having tested the individual fittings, the survey report will clearly show if your boat is completely bonded correctly or if there are problems with your bonding. **The unit also shows up if there are stray D/C or A/C currents on the boat which can cause horrendous damage very quickly.**

The kit should be used every 6 months on a boat to ensure the anodes are still working and all the bonding cables are correct.

Where continuous onboard monitoring is required see Onboard Yacht Corrosion Monitor below.

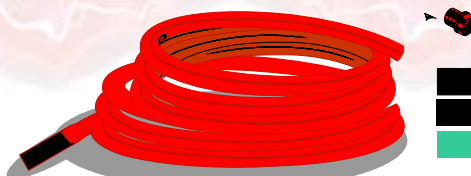
The Analog Corrosion Test Meter is supplied complete with:-
20ft red lead with essential Silver/Silver chloride half cell
10ft black lead test probe
This easy to read meter finds all corrosion problems instantly.
Scale needs no interpretation Green=Good
Yellow=Bad.

Corrosion Test Meter Plus Book	
Code	Price inc vat
CTMB	£ 188.90



20ft Extension Lead For Above Test Meter

Where larger boats are being surveyed the standard 20ft lead will need to be extended with this special extension lead.



20ft Extension Cable	
Code	Price inc vat
CTME	£ 47.90

Yacht Corrosion Meter

Yacht Corrosion Meter

This onboard, panel mounted meter monitors galvanic voltage and is suitable for boats up to 65ft.

It instantly confirms adequate protection or identifies damaging corrosion voltages.

Simple yellow and green scale monitors the voltage.

Supplied with Silver/Silver Chloride half-cell sensor.

Gives clear indication if anodes need to be replaced and instantly picks up any problems with shore power, earth leaks etc.

The unit permanently monitors your bonding cable, using a Silver / Silver chloride through hull reference point.

This product should be used after the survey system (above) confirms that your bonding system is correctly connected to all your fittings



Silver silver anode though hull fitting



Yacht Corrosion Monitor	
Code	Price inc vat
CYM	£ 176.90

UNITED KINGDOM:

Marathon Leisure
Teal Building
Northney Marina
Hayling Island
Hampshire
PO11 0NH
Tel +44 2392 637711

Midland Chandelers

Parkgate Lock
Teddesley Road
Penkridge
Staffordshire
ST19 5RH
Tel +44 1785 712437

Battery Megastore

5 Kennet Close
Tewkesbury Business Park
Tewkesbury
Gl20 8TY
Tel: +44 1684 298800

Down Marine Co Ltd

163 Comber Road
Dundonald
Belfast
Co Antrim
Tel +44 2890 480247

RoadPro Ltd

Stephenson Close
Daventry
Northants
NN11 8RF
Tel +44 1327 312233

ANTILLES:

Island Water World Off Shore
1 Wellsburg Road
Coe Bay
St. Maarten
Tel +39 06 39746889

AUSTRALIA:

RV Powerstream P/L
Lot 25
Macwood Road
Smiths Lake
NSW 2428
Tel +61 265 544 444

AUSTRIA:

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Triesterstr. 150-152
8073 Feldkirchen/Graz
Tel +43 316 293 929

Werkhof Diskontmarin GmbH & Co.KG

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1200 Wien
+43 133 078 24

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(branches around the world)
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BP 435
56325 Lorient Cedex
Tel +33 297 873 648

Seatronic

Le Cap, CS 18807
54 Rue du Grand Jardin
35418 Saint Malo Cedex
Tel +33 299 19 69 64

GERMANY:

Ocean Marine HandelsGmbH
Pinkertweg 10
22113 Hamburg
Tel +49 40 2191042

Herman Gotthardt GmbH

Leunastr. 50
22761 Hamburg
Tel +49 4085 1505 0

GIBRALTAR

M. Sheppard's Chandlery
Waterport
Tel: +350 751 48

GREECE:

Nautilus Ltd.
2 Metamorfoseos
Alimos
Athens 1745
Tel +30 2109854238

Boatsman World

The Boat House
Kontokali
Corfu 49100
Tel +30 26610 80104

FINLAND

Navigreen Oy Ltd
Pursilahnentranta 2D
00980 Helsinki
+358 400 697424

ICELAND

Aukaraf EHF
Dalbrekku 16
Kopavogur
Is200
Tel +354 585 0000

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53 Haparsa St.
Zhal
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Tel: +972 54 4408086

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Via Ionian 44
I-00141 Roma
Tel +39 06 39746889

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De Dolder 1
1454 Alwatergang
Tel +31 204369100

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Elveveien 150
3271 Larvik
Tel +47 33179554

Seaton AS

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1598 Moss
Tel +47 69260960

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46 Rua Fernao Mendes
1400-146 Lisboa
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St. Petersburg 197 11
Tel +812 320 1853

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Tel +34 93357 2608

Videocast S.L.

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Valencia
+34 96 296 5101

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9402 Morschwil
Tel +41 79457 44 84

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Turipeks Ltd.
Depolar 87
48000 Mani
Mugla
+90 252 4133041

U.S.A. (partner company)

Professional Marine
P.O. Box 968
Rye
New Hampshire 03801
Tel +1 603 433 4440

This is not the full list by any means, there is simply no room for this, please e mail Sterling if your country/area is not on this list

www.sterling-power.com

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Wassage way
Hampton Lovett Ind Est
Droitwich
WR9 0NX
England
Tel (44) 0 190577 1771
Fax (44) 0 190577 9434
email help@sterling-power.com

2 YEAR GUARANTEE: RETURN TO FACTORY
IF IN THE FIRST 2 YEARS YOU HAVE A FAULTY STERLING PRODUCT
THE PRODUCT SHOULD BE RETURNED DIRECT TO
STERLING (TO SPEED UP THE HELP PROCESS) AND WE WILL
ENDEAVOUR TO REPLACE THE PRODUCT OR REPAIR IT WITHIN
24 HRS AT THE FACTORY. STERLING CANNOT BE
HELD RESPONSIBLE FOR THE RETURN CARRIAGE.
LIFE TIME REPAIR POLICY
AFTER 2 YEARS IF IT IS UNECONOMIC TO REPAIR THE
PRODUCT THEN A SPECIAL DISCOUNT WILL BE OFFERED
ON A SIMILAR PRODUCT AT THE FACTORY'S DISCRETION.
THIS ONLY APPLIES AT THE FACTORY.